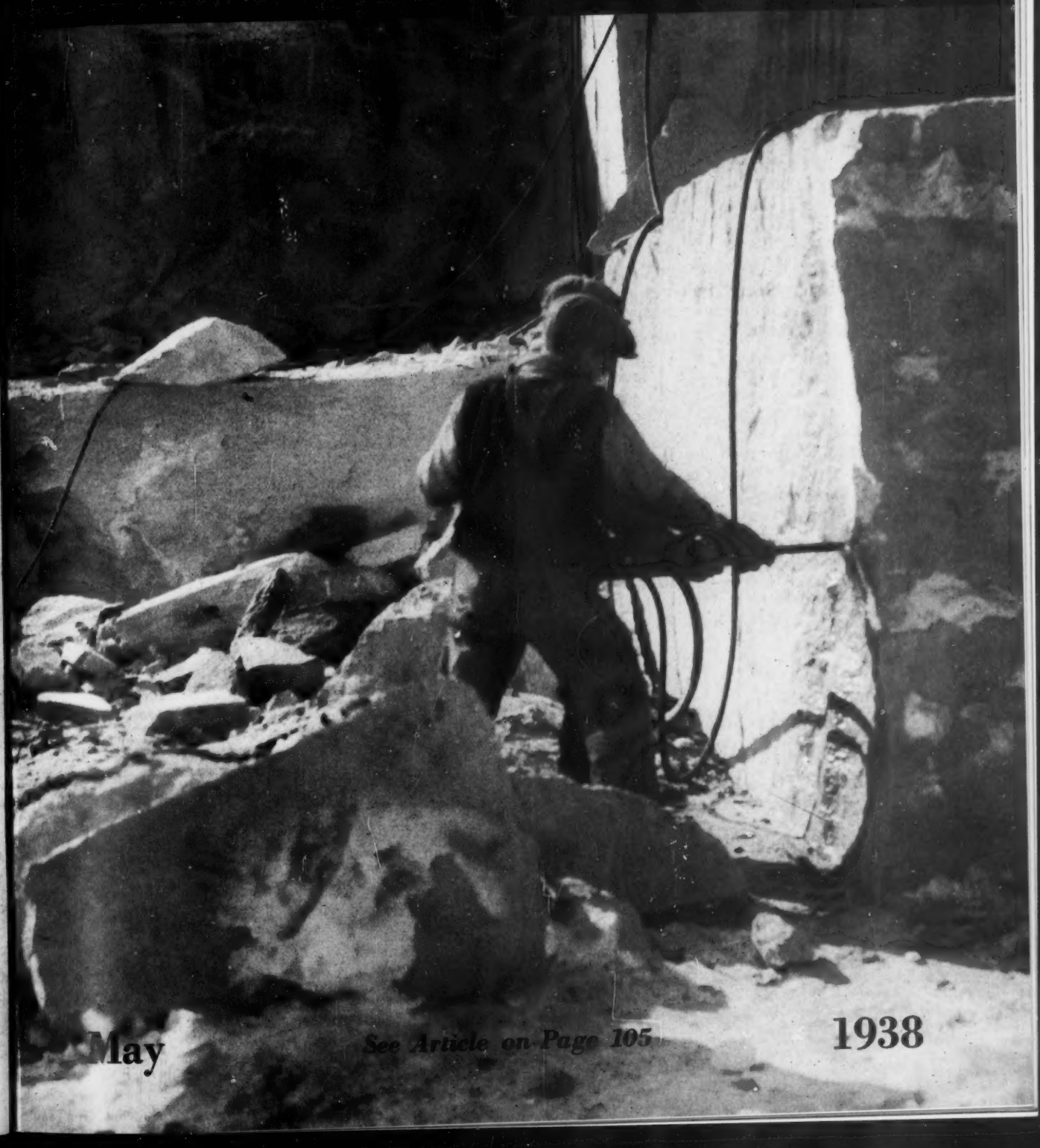
Industrial Standardization

and Commercial Standards Monthly



May

See Article on Page 105

1938

The American Standards Association

THE American Standards Association is a federation of national groups. Through it government, industry, labor, and the consumer work together to develop mutually satisfactory standards.

The some four hundred standards and safety codes developed to date in the building, mining, consumer goods, traffic, mechanical, electrical, and other fields are widely used throughout industry and by municipal, state and federal governments. These standards simplify and clarify operations. They allow for interchangeability of supplies, or secure the interworking of parts. They eliminate the waste of time and material involved in the production of an unnecessary variety of patterns and sizes of articles for one and the same purpose. They define technical terms used in industry, specify qualities for materials and methods of test for the finished product. They guard the fingers of punch press operators, and the lives of window cleaners, making possible uniform requirements in safety devices for machines and other equipment in the fields of both public and industrial safety. They are becoming increasingly important factors in industrial health, in building, and in specifications for consumer goods sold in retail trade.

In all its activities the Association maintains the community of interest of producer and purchaser. In no case does it undertake work without first ascertaining that there is strong opinion in favor of it, and that the completed standard is to fulfill a recognized want.

The work of the Association, which operates for service and not for profit, is financed entirely through memberships. There are two general types of members—national organizations and company members. The 74 national organizations include technical societies, trade associations, and departments of the federal government. Many of these through the Board of Directors share in managing the financial and administrative affairs of the organization. All, through the Standards Council, may participate in the technical work of the Association.

Company Members are entitled to services from the Association in proportion to the size of the company and the amount of dues paid. These services include free copies of newly approved standards, a discount of 20 per cent on additional purchases, free subscriptions to the ASA magazine carrying news of standardization developments and the practical application of standards and safety codes in industry.

The ASA Library, the only place in the United States where an up-to-date file of foreign standards and specifications is kept, has a total of 20,000 books and pamphlets on standardization problems. A library research service, free to members, is frequently able to supply companies with the information needed to fill an order or to close a bid.

The American Standards Association was organized in 1918. Its remarkable growth in activities and prestige has been made possible by the support of industry and the fine cooperation of many hundreds of organizations on difficult intergroup problems. Those national associations and individual companies not already affiliated are invited to investigate the work of the Association and to participate in whatever technical activities they find of interest to them.

AMERICAN STANDARDS ASSOCIATION

Officers

Dana D. Barnum, President
P. G. Agnew, Secretary
Edmund A. Prentis, Vice-President
Cyril Ainsworth, Assistant Secretary

Board of Directors

Dana D. Barnum, Boston, Mass., President, American Standards Association

George H. Benzon, Jr., vice-president, William Sellers & Company, Inc., Philadelphia—National Machine Tool Builders Association

Lyman J. Briggs, director, National Bureau of Standards, Washington, D. C.—U. S. Department of Commerce

H. P. Charlesworth, assistant chief engineer, American Telephone & Telegraph Company, New York—American Institute of Electrical Engineers

C. L. Collens, president, Reliance Electric & Engineering Company, Cleveland, Ohio—National Electrical Manufacturers Association

Howard Coonley, chairman of Board, Walworth Company, New York—Past-President, American Standards Association

Wallace Falvey, vice-president, Massachusetts Bonding & Insurance Company, New York—National Conservation Bureau

F. M. Farmer, vice-president, Electrical Testing Laboratories, New York—Chairman, ASA Standards Council

J. C. Irwin, valuation engineer, Boston & Albany Railroad, Boston, Mass.—Past-Chairman, ASA Standards Council

D. J. Kerr, president, Lehigh Valley Railroad Company, New York—Association of American Railroads

John C. Parker, vice-president, Consolidated Edison Co. of New York, New York—ASA Electric Light & Power Group

Leonard Peckitt, president, Warren Foundry & Pipe Company, New York—Cast Iron Pipe Research Association

C. E. Pettibone, vice-president, American Mutual Liability Insurance Company, Boston, Mass.—National Association of Mutual Casualty Companies

J. Edgar Pew, vice-president, Sun Oil Company, Philadelphia—American Petroleum Institute

Edmund A. Prentis, Spencer, White & Prentis, Inc., New York—Vice-President, American Standards Assn.

A. R. Small, president, Underwriters' Laboratories, Chicago, Illinois—ASA Fire Protection Group

Gustave W. Thompson, member of Board, National Lead Company, Brooklyn, N. Y.—American Society for Testing Materials

R. E. Zimmerman, vice-president, U. S. Steel Corporation, New York—American Iron and Steel Institute

Standards Council

F. M. Farmer, vice-president, Electrical Testing Laboratories, New York, Chairman

R. P. Anderson, secretary, Division of Refining, American Petroleum Institute, New York, Vice-Chairman

Chairmen of Correlating Committees

Alfred Iddles, Babcock & Wilcox Co., New York—Mechanical

H. W. Brightman, vice-president, L. Bamberger & Co., Newark—Consumer

Dan Harrington, chief, Health & Safety Branch, U. S. Bureau of Mines—Mining

Rudolph P. Miller, Consulting Engineer, New York—Building

C. R. Harte, Connecticut Company, New Haven, Conn.—Electrical

L. F. Adams, General Electric Company, Schenectady, N. Y.—Safety

ASA Member-Bodies

Am. Gas Association
Am. Home Economics Assn.
Am. Institute of Bolt, Nut & Rivet Mfrs.
Am. Institute of Elec. Engineers
Am. Iron & Steel Institute
Am. Petroleum Institute
Am. Soc. of Civil Engineers
Am. Soc. of Mechanical Engineers
Am. Soc. for Testing Materials
Am. Transit Association
Assn. of American Railroads
Assn. of Am. Steel Manufacturers Technical Committees
Assn. of Gas Appliance & Equipment Mfrs.
Automobile Mfrs. Assn.
Cast Iron Pipe Research Assn.
Electric Light and Power Group:
  Assn. of Edison Illuminating Companies
  Edison Electric Institute
Federal Housing Administration
Fire Protection Group:
  Associated Factory Mutual Fire Insurance Companies
  Nat. Bd. of Fire Underwriters
  Nat. Fire Protection Assn.
  Underwriters' Laboratories, Inc.
Institute of Radio Engineers
Mfrs. Standardization Soc. of the Valve and Fittings Industry
Nat. Assn. of Master Plumbers of the U. S.
Nat. Assn. of Motor Bus Operators
Nat. Assn. of Mutual Casualty Companies
Nat. Conservation Bureau
Nat. Electrical Mfrs. Assn.
Nat. Machine Tool Builders' Assn.
Nat. Retail Dry Goods Assn.
Nat. Safety Council
Soc. of Automotive Engineers
Telephone Group:
  Bell Telephone System
U. S. Department of Agriculture
U. S. Department of Commerce
U. S. Department of the Interior
U. S. Department of Labor
U. S. Govt. Printing Office
U. S. Navy Department
U. S. War Department

Associate Members

Am. Automobile Association
Am. Council of Commercial Labs.
Am. Gear Mfrs. Association
Am. Hospital Association
Am. Soc. of Heating & Ventilating Engineers
Am. Soc. of Refrigerating Engrs.
Am. Soc. of Sanitary Engineering
Am. Trucking Assns., Inc.
Am. Water Works Association
Anti-Friction Bearing Manufacturers Association, Inc.
Asphalt Shingle & Roofing Inst.
Assn. of Iron & Steel Engrs.
Associated Gen. Contractors of Am.
Brick Mfrs. Assn. of N. Y.
Grinding Wheel Mfrs. Association
Gypsum Association
Heat Exchange Institute
Hydraulic Institute
Illum. Engineering Society
Industrial Safety Equipment Assn.
Insulation Board Institute
Internat. Acetylene Association
Metal Lath Mfrs. Association
Motor Truck Association of Am.
Nat. Elevator Mfg. Industry, Inc.
Radio Mfrs. Association
Soc. of Motion Picture Engineers
Structural Clay Products Institute
U. S. Cap Screw Service Bureau
U. S. Machine Screw Service Bur.
U. S. Wood Screw Service Bureau
Vacuum Cleaner Mfrs. Association

Industrial
Standardization

Combined with Commercial Standards Monthly

Published Monthly by

American Standards Association
29 West 39th Street, New York

with the cooperation of the National Bureau of Standards

RUTH E. MASON, *Editor*

This Issue

Our Front Cover: Drilling in a granite quarry, the dust controlled by water ejected through hollow drill steel. Photo courtesy U. S. Department of Labor

ASA Reorganizes Advisory Committee—To Act on Limits for Dusts and Gases. By Cyril Ainsworth 105
New Committee to Advise ASA on Highway Traffic Standards 111
Safety Code Correlating Committee Coordinates Safety Requirements 113
Signs — To Carry Warning, Advise on Safety, Mark Directions. By Mark Bulot 115
Economy and Speed of Heating Emphasized in Revised Standards for Hotel Ranges. By Franklin R. Wright 121
How Mass Production, Standardization Lower Costs, Raise Living Standards 123
Building Codes Combine Facts and Judgment. By H. L. Dryden 124
U. S. Delegates to Attend International Meetings 125
New Committee Organizes to Develop Bedding Standards 126
Revision of Radio Standard Extends Safety Requirements to Other Devices. By J. W. Fulmer 127
Thompson Represents A.S.T.M. on ASA Board of Directors 131

Bureau for Traffic Research at Yale University 109
A.S.T.M. to Develop Tests for Unit Masonry Mortars 110
Mechanical Standards Committee Re-Elects Iddles, Morehead 110
Safety Engineers Urge Standard State Codes 110
Research Paper Describes Study on Sand-Lime Brick 110
Aluminum Association Recommends Standards 112
Revised Recommendation for Building Units 113
International Committee on Welding Proposed 114
British Issue New Edition of Paint Drier Standard .. 114
Uniform Elevator Requirements Goal for Canadian Code 114
Body Measurements Financed by WPA Funds 114
Gaillard to Speak on Standards 119
A.S.T.M. Annual Meeting to Be June 27 120
Air Hygiene Foundation to Study Diseases 120
Federal Specifications Received by ASA 120
Germany Standardizes on Ten Types of Tires 123
Ball Bearing Standards in One Volume 126
Safety Code for Power Presses for Sale 126
New Australian Test Specifications 129
Revised Standard for Marking Gold Articles 129
ASA Withdraws Project on Zinc Ores 129
Index to British Standards 129
A.S.T.M. Organizes New Radiographic Committee .. 130
A.H.E.A. Program for Annual Meeting 130
Equipment Committee in Argentina 130
Monthly Index to Technical Magazines 131
Addendum to Standard Changes 150 Lb Pipe Fittings 131
Australia Starts Work on Lighting Standards 131

ASA

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Subscription price $4.00 per year U. S. and Canada (foreign $5.00); Special to schools and libraries $2.00 (foreign $3.00); single copies 35 cents

May, 1938 **Vol. 9, No. 5**

U. S. Department of Labor Photo

Granite dust — one of the types to be studied by the new ASA sectional committee. This picture shows a granite surfacer being operated without exhaust. Our front cover shows a horizontal jackhammer drilling in a granite quarry. The dust is being controlled by water ejected through hollow drill steel

ASA Reorganizes Advisory Committee— To Act on Limits for Dusts and Gases

Committee of Experts Will Have Authority to Develop Standards for Safe Amounts of Toxic Materials in Air

by

Cyril Ainsworth

Assistant Secretary, American Standards Association

HOW much of a harmful dust or gas can be contained in the air of a workroom without injury to the workers? Judges, insurance companies, industrial organizations—not to mention workmen themselves—ask the question again and again.

State regulatory bodies have attempted to set up tables showing permissible concentrations for the guidance of the establishments under their jurisdictions. Research organizations have been set up to find out more about the effects of different amounts of dusts and gases. Trade associations have worked to compile this information for their members. Judges and juries are trying to find or establish precedents to guide them in legal decisions. But again and again the testimony in expensive lawsuits for damages against employers because of workers' exposure to toxic substances has demonstrated how little is actually known concerning this matter.

Facts as to the bearing of working conditions upon health are not readily available. At present, when a worker is exposed to a dust or gas or other harmful substance during his employment and is

U. S. Department of Labor Photo

Fumes and gases in foundries frequently cause trouble. Here are foundry crucibles before the installation of a hood for carrying off fumes and gases.

incapacitated, or perhaps even dies, from some serious illness it is usually impossible to know how far the conditions of his employment have contributed to that illness. Compensation and illness records refer to the immediate cause of illness or death rather than to contributing causes such as exposure to dusts and gases.

Advisory Committee Restricted

An increasing demand for further information as to the effect of workroom conditions upon health in those employments where toxic substances are given off and must be removed from the workroom air, as well as a need for coordinating the work of many independent groups in this field resulted more than a year ago in the organization of a committee of eminent toxicologists, pathologists, and industrial engineers to advise the American Standards Association in setting up standards for exhaust systems. In its advisory capacity the work of this committee was restricted to definite requests from other ASA committees. It did not begin to fill the need for authoritative information.

Now, by action of the Standards Council of the American Standards Association, taken April 14th, this committee has been released from its restrictions as an advisory committee and given authority to develop the much needed standards for safe limits of concentration for toxic dusts and gases.

The problem facing the new technical committee is not a simple one. It will have the responsibility of reviewing the work already done by other organizations and of setting up specific standards to indicate the minimum quantities of toxic materials in the air which will produce recognizable physiological effects. These standards will be developed in the light of present knowledge, recognizing that they will have to be modified from time to time as additional information is obtained. They will furnish information as to what constitutes injurious exposure for the use of physicians and engineers interested in control of occupational diseases and for possible use in connection with compensation cases. Insurance rates are based on a company's control of dangerous conditions, and the work of the committee will help insurance companies advise their policyholders as to what control is needed.

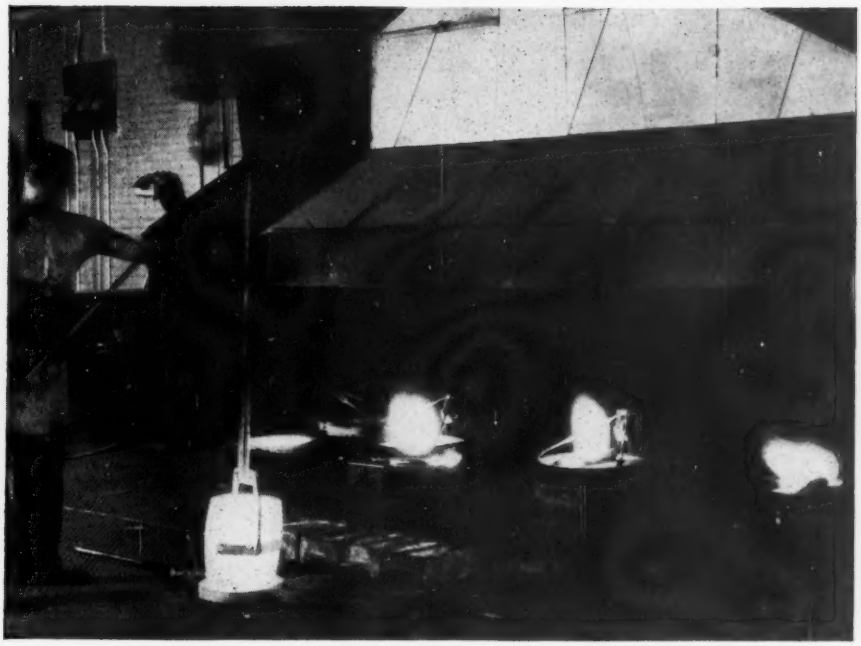
May Need Standard Analysis

It may be that the committee will have to go deeper into the problem and establish some standard procedure for analyzing the concentration of dust in the air. It may be faced with the problem of what to do when dusts in the air are mixed, and of the relation of mixed dusts to clearly defined dusts.

New and additional research will be the basis for many of the committee's decisions. The results of what research has been completed will have to be collected and correlated.

It has been suggested that the work of the committee will probably divide itself into a study of several different types of dusts and gases:

Those having their origin in toxic metals, such as lead, arsenic, and mercury



Foundry crucibles showing exhaust hood for removing fumes and gases.

U. S. Department of Labor Photo

Those arising from toxic compounds, such as benzol and its homologues, nitrous fumes, alcohols, esters, aldehydes

Irritating substances, such as chromic acid, chlorine, sulphur dioxide

Substances containing free silica, which in a fine state of suspension in the atmosphere does not cause immediate toxic or irritating effects but which does in the course of time produce pathological changes in the lungs, which may lead ultimately to disability and death; also substances containing silica in combined form which can or, presumably, may cause effects comparable to those produced by free silica

Substances most commonly organic, though not necessarily so, which may excite allergic reaction

Substances containing spores of fungi which may cause disease

This classification of substances has not as yet been accepted by the committee and it has simply been suggested in order that the committee will have something before it as a possible plan of work.

These substances differ widely in their effects. Some of them make their presence felt in the atmosphere even when they are present in very small quantities. Others can not be recognized except through chemical analysis. The difficulty of the problem is further complicated by the fact that their effects may be modified or intensified by a worker's previous organic defects or chronic diseases.

It has been said that usually the more definitely toxic a substance is—the more acute the reaction it produces—the more easily its threshold limit can be established. For this reason, a good deal is already known about the substances in the first group. The amount of lead in the atmosphere, for instance, which will produce lead poisoning in a given time is quite definitely known.

The second group offers much greater difficulties. In this group are found compounds in industrial use which vary in composition from time to time, and it may prove extremely difficult if not impossible to establish accurate limits for some of them.

In group three the substances carry their own warning. Usually exposure to them is so irritating even in quantities that might not produce severe effects that their presence cannot be overlooked.

Silica in Public Eye

The fourth group—substances containing free silica—has been much in the public eye recently. The substances contained in this group act with extreme slowness so that their effects are noted only over a period of years. However, it has been found that the death rate among workers in occupations where the silica dust hazard exists is sometimes two to ten times that of the general male population. From time to time, lawyers take advantage of this situation and of the small amount of knowledge available on the subject to bring spectacular damage suits against employers. The problem of finding a solution to this problem is complicated by the fact that the dustiness of various processes in this group differs widely from day to

day and from hour to hour. The amount of silica dust in the atmosphere is measured in millions of particles per cubic foot, and research indicates that it will be difficult to establish anything in the nature of close limits for these dusts.

Little is known about substances in the fourth group—those with reactions of an allergic nature—because their effect differs greatly with the individual. For instance, the amount of a given substance which will produce an allergic reaction in a previously sensitized individual may be infinitely small.

As to the fifth group, there is evidence that the type of pulmonary disease due to dusts containing spores of fungi deserves more attention than it now receives. Information on this subject is very limited, however.

Some attempts have already been made to set permissible limits for a few dusts in these classifications. The Dust and Fume Code Committee, appointed by the Legislature of Massachusetts, is preparing a table of maximum allowable concentrations of 39 toxic substances. The American Foundrymen's Association has a proposed code on grinding, buffing, and polishing. The U. S. Public Health Service has set 35 per cent free silica as the limit for granite dust, and the Medical Series Bulletin of the Air Hygiene Foundation states that it is "desirable to avoid concentrations of more than five million particles of dust containing a high concentration of free silica in working places." Industrial research laboratories, of which the Haskell Laboratory of Industrial Toxicology established by the E. I. duPont de Nemours & Company is one, are working on the problem of concentrations of dusts and gases.

The New York Department of Labor is only one of the state regulatory groups being called on to approve the installation of ventilation systems. Some 2,000 ventilation plans are approved annually by this one state department alone. For lack of scientific data, its decisions at present are made on the basis of results obtained through field tests from time to time.

Medical Experts, Research Workers To Develop Safe Limits for Dusts

The Advisory Committee on Toxic Dusts and Gases of the American Standards Association has been released from the necessity of waiting for requests for information and is being re-organized to develop standards for safe limits of concentration of toxic dusts and gases. Members of the new committee, the Sectional Committee on Toxic Dusts and Gases, are all experts with a special knowledge of problems involved in control of occupational diseases.

The committee members, with the addition of several experts from the chemical industry, will be:

Dr. R. R. Sayers, *Chairman*
Dr. Roy R. Jones, *Technical Secretary*
Dr. Cecil K. Drinker, School of Public Health, Boston, Mass.
Philip Drinker, Associate Professor, School of Public Health, Boston, Mass.
Dr. Leroy U. Gardner, Director, The Saranac Laboratory for the Study of Tuberculosis, Saranac Lake, N. Y.
Dr. Howard W. Haggard, Associate Professor of Applied Psychology, Timothy Dwight College, Yale University, New Haven, Conn.
Theodore Hatch, Associate Dust Control Engineer, Division of Industrial Hygiene, N. Y. Department of Labor, New York, N. Y.
Dr. Yandell Henderson, Laboratory of Applied Physiology, Yale University, New Haven, Conn.
Dr. John Johnston, Director of Research, U. S. Steel Corporation, Kearny, N. J.
Dr. A. J. Lanza, Assistant Medical Director, Metropolitan Life Insurance Company, New York, N. Y.
Dr. Carey P. McCord, Dodge Main Plant, Chrysler Corporation, Detroit, Michigan
Dr. Edgar Mayer, Assistant Professor of Clinical Medicine, Cornell University, New York, N. Y.
Dr. Eugene L. Opie, Department of Pathology, Cornell University Medical College, New York, N. Y.
Dr. R. R. Sayers, Senior Surgeon, Office of Industrial Hygiene and Sanitation, U. S. Public Health Service, Washington, D. C.
F. W. Sehl, Chemical Engineer, Aetna Life Insurance Company, Hartford, Connecticut
Dr. C. D. Selby, Medical Consultant, General Motors Corp., Detroit, Mich.
Dr. W. F. von Oettingen, Director, Haskell Laboratory of Industrial Toxicology, Wilmington, Del.
Dr. B. L. Vosburgh, General Electric Company, Schenectady, N. Y.
Dr. C. H. Watson, Medical Director, American Telephone and Telegraph Company, New York, N. Y.
S. E. Whiting, Vice-President, Liberty Mutual Insurance Company, Boston, Mass.
Wm. P. Yant, Director of Research and Development, The Mine Safety Appliances Company, Pittsburgh, Pa.

Recently, requests for authoritative information have been received more and more frequently from states and industrial groups faced with the problem of setting up allowable concentrations for dusts, gases, and fumes in industrial processes.

The technical committee in charge of the Safety Code for Exhaust Systems, under the procedure of the American Standards Association, found that it would need information concerning permissible limits of various dusts, gases, and fumes in developing standards for exhaust systems. Because of this need, a national advisory committee on toxic dusts and gases was organized by the American Standards Association. The members of the committee were eminent toxicologists, pathologists, and industrial engineers, all with a special interest in the subject, and with experience in dealing with various phases of it. The restrictions under which it operated as an advisory committee, however, prevented definite action without a request from other ASA committees.

As a result, the International Association of Industrial Accident Boards and Commissions, sponsor for the exhaust code committee, asked the American Standards Assocation to release the Advisory Committee from its restrictions and reorganize it as a technical committee. This action was taken at the last meeting of the Standards Council. The new committee is now being organized, with a scope of action as follows:

To determine and promulgate the allowable concentration limits of harmful gases, vapors, fumes, dusts, and mists; and other subjects related to the allowable concentration limits of such substances in the atmosphere of working places from the viewpoint of occupational disease prevention.

The committee is being organized as a scientific or non-commercial sectional committee, including many experts with experience and special knowledge of the problems involved. To advance the work of the committee as rapidly as possible, Dr. Roy R. Jones of the U. S. Public Health Service has been appointed to act as its technical secretary.

U. S. Department of Labor Photo

This photograph showing a silica flour bag loader protected by an exhaust hood is a "still" from a one-reel sound-motion picture "Stop Silicosis" produced by the Division of Labor Standards, U. S. Department of Labor. The picture, which dramatizes the causes and results of silicosis, can be obtained by any interested individual or group for exhibition purposes without charge other than transportation expenses.

Bureau for Traffic Research Opens at Yale University

The work of the Harvard Bureau for Street Traffic Research which has been a cooperating organization in the work of the American Standards Association on standardization in the traffic field, is now being carried on at Yale University. Miller McClintock continues as director of the reorganized Bureau.

The Bureau is offering 15 graduate fellowships. Students are required to take the four graduate courses offered by the Bureau, be in attendance for visiting lecturers, and participate in field trips. Upon successful completion of these courses, students will be eligible to receive a "Certificate in Transportation," subject to the approval of the Committee on Transportation of Yale University. The courses cover principles of street and highway traffic control, problems of street and highway traffic control, planning and design of traffic facilities, and economics and administration of traffic control.

The staff includes Miller McClintock, director; Maxwell Halsey, Associate Director; Theodore Matson, Research Associate in Transportation; Theodore Forbes, Research Associate in Transportation.

The Bureau's activities have been made possible through grants to Yale University by the Automotive Safety Foundation, Paul G. Hoffman, president.

Safety Engineers Urge Standard State Codes

"To eliminate machine accidents resulting from unguarded gears, belts and pulleys, and dangerous points of operation, the American Society of Safety Engineers has sponsored a committee to encourage the safeguarding of machinery at the time of its manufacture. Most machines now sold are unguarded or must be guarded by makeshift methods by the user. The committee agrees that safe machines, with guards an integral part of the machine, can and should be the only type sold by the manufacturer and accepted by the user.

"The committee urgently requests the cooperation of State labor departments in standardizing state codes, so that machines that are properly guarded at the time of manufacture will be acceptable in whatever State they may be sold. As its plans develop, the committee's representatives will confer with the enforcement agencies in the States for their views on what constitutes an adequately guarded piece of machinery."—*Division of Labor Standards' Survey of Labor Law Administration, January, 1938.*

Research Paper Describes Study On Strength of Sand-Lime Brick

Strength has been found to be a fair measure of the resistance to freezing and thawing of sand-lime brick strength when they comply with the visual inspection clause of the American Society for Testing Materials' Specification for Sand-Lime Brick C 73-30, it was concluded in a paper describing a research project carried out at the National Bureau of Standards by John W. McBurney and Allan R. Eberle.

The compressive and transverse strengths, water absorption, and penetrability of 120 specimens of sand-lime brick representing 11 plants were determined. Sieve analyses of sands from the same plants were made. The same bricks were subjected to 50 cycles of freezing and thawing.

Copies of the research paper, RP1065, may be ordered from the Superintendent of Documents, Government Printing Office, Washington, D. C., at five cents each.

A.S.T.M. to Develop Tests For Unit Masonry Mortars

The committee on Mortars for Unit Masonry, C-12 of the American Society for Testing Materials, was reorganized recently and a subcommittee on methods of testing was appointed to start work immediately.

J. W. McBurney, senior technologist, National Bureau of Standards, Washington, D. C., was elected chairman of the reorganized committee. Theodore I. Coe, technical secretary, Structural Service Department, American Institute of Architects, was chosen first vice-chairman; H. D. Baylor, vice-president, Louisville Cement Company, second vice-chairman; and H. C. Plummer, chief engineer, Structural Clay Products, Inc., secretary.

The scope of the committee includes preparation of specifications, test methods, and definitions relating to mortars for use with units of burned clay or shale, sand-lime, concrete and stone and similar materials used in unit masonry, other than those intended for use as refractories.

Mechanical Standards Committee Re-Elects Iddles and Morehead

At its meeting April 13, the Mechanical Standards Committee of the American Standards Association re-elected Alfred Iddles chairman for the coming year. Mr. Iddles, of the Babcock and Wilcox Company, New York, represents the American Society of Mechanical Engineers on the committee. F. H. Morehead, vice-president and chief engineer, Walworth Company, representing the Manufacturers Standardization Society of the Valve and Fittings Industry, was re-elected vice-chairman.

Members of the Executive Committee for this year were elected as follows:

J. E. Ennis, Engineering Assistant, New York Central System, representing the Association of American Railroads, Mechanical Division

F. O. Hoagland, Master Mechanic, Pratt & Whitney Division, Niles-Bement-Pond Company, Hartford, Conn., representing the National Machine Tool Builders Association

Harold H. Morgan, vice-president, Robert W. Hunt Company, Chicago, representing the American Society for Testing Materials

David Levinger, Engineer of Manufacture, Western Electric Company, Inc., New York, representing the ASA Telephone Group

A. Rousseau, Abrasive Division, Sales Engineering Dept., Norton Company, Worcester, Mass., representing the Grinding Wheel Manufacturers Association

The Mechanical Standards Committee is one of the seven general administrative committees which coordinate ASA work in their fields.

New Committee to Advise ASA On Highway Traffic Standards

Seventh coordinating committee added to ASA committees now working on mechanical, electrical, building, safety, mining, and consumer goods problems

AUTOMOBILE registrations increased 42 per cent between 1925 and 1936; gasoline consumption increased 174 per cent.

The tremendous growth in traffic represented by these figures presents an ever-growing problem—how to prevent the appalling accident toll; how to coordinate and unify varying highway, motor, and traffic requirements.

At the last meeting of the Standards Council, the American Standards Association recognized this problem, and authorized a new coordinating committee to facilitate standardization work on highway traffic. The new committee, bringing together motor, highway, and safety experts, will advise the Association and correlate its standardization work on highways and motor traffic.

Automobile manufacturers, traffic experts, and safety engineers, meeting in May, 1937, found that the Safety Code Correlating Committee, under which most of the ASA's traffic work has been done, does not include many of the organizations interested in traffic problems. A new committee to include these organizations was recommended.

17 Problems Suggested

Although most of the traffic work carried on by the ASA up to this time has been in the safety field, subjects outside this field have recently been demanding attention. Seventeen different problems touching on the car, the road, the driver, and general traffic, have been suggested from time to time as possible subjects for standardization. Many of

Traffic Problems Suggested For Committee's Action

Among the many subjects suggested for standardization are the following:

The Car

- Special requirements for safety glass for trucks and busses
- Tire construction
- Special design improvements

The Road

- Specifications for highway guard rails
- Automatic control devices for low-speed driving
- Lane separation to prevent traffic conflicts
- Rotary traffic islands
- Visual distances
- Degree of curves with relation to topography, speed, vehicles, etc.
- Easement of curves
- Special barriers for drawbridges, railroad crossings, etc.
- Road shoulders
- Highway lighting
- Functional specifications for traffic signs
- Grade separations at railroad crossings and highway intersections

The Driver

- Uniform driver qualifications and tests
  - Technical, psychological, physical requirements
- Hand signals
- Special qualifications for drivers of public conveyances—Busses, Taxicabs

Miscellaneous

- Uniform regulations for making turns at intersections on red and green lights
- Uniform methods for recording and compiling accident statistics including rates and causes
- Specifications for fuses, flares, electric lanterns, etc.

These and any other subjects which may be suggested in the future will be referred to the new highway traffic committee for recommendations to the ASA.

these are related to safety, but would not normally come under the jurisdiction of the Safety Code Correlating Committee.

Standards already approved by the American Standards Association are helping to bring about uniform state motor regulations. The Safety Code for Colors for Traffic Signals, the American Standard Manual on Uniform Traffic Control Devices for Streets and Highways, the Specifications and Methods of Test for Safety Glass, and the American Standard for Railroad Highway Grade Crossing Protection are all recognized guides for uniform traffic requirements.

Every year more states and cities require periodic inspection of motor vehicles, but no recognized national standards have been available as a basis for these inspections. To remedy this, a committee of the American Standards Association is now working on inspection standards—for brakes, lights, tires, alignment, accessories, etc.

These projects, already completed by the ASA or now under way, with the exception of safety glass which includes types of glass not used in motor vehicles, will be transferred to the new committee when organized. In its capacity as a correlating agency, the committee will study proposals for new projects, make recommendations to the American Standards Association on whether work should be started or not, approve the personnel of committees, and recommend action on revisions of existing standards or approval of new standards.

To Revise Signal Colors

One of the first pieces of work to come before the new committee will be a revision of the American Standard Safety Code for Colors for Traffic Signals. A growing tendency in the automotive industry to deviate from the national standard shades of green, red, and yellow used in traffic signals, has been noted recently. The Safety Code Correlating Committee, which has had this project under its guidance has already recommended that the Specifications for Colors be revised under a new sponsorship. It also recommends that the section of this standard on Vehicle Lights and Signals be transferred to the project on Standards for the Inspection of Motor Vehicles, and that the section on Highway Traffic Signals be included in a revision of the American Standard Manual on Uniform Traffic Control Devices for Streets and Highways.

Organization of the new highway traffic committee will bring the number of committees now correlating activities of the American Standards Association in specific engineering or industrial fields to seven. Those already active are the Building Code Correlating Committee, Electrical Standards Committee, the Mechanical Standards Committee, the Mining Standardization Correlating Committee, the Safety Code Correlating Committee, and the Advisory Committee on Ultimate Consumer Goods.

Nineteen organizations have been asked to name representatives on the Highway Traffic Standards Committee. They are:

American Association of Motor Vehicle Administrators
American Association of State Highway Officials
American Automobile Association
American Transit Association
American Trucking Associations, Inc.
Association of American Railroads
Automobile Manufacturers Association
Bureau of Street Traffic Research
Interstate Commerce Commission — Bureau of Motor Carriers
Institute of Traffic Engineers
National Association of Mutual Casualty Companies
National Association of Railroads & Utilities Commissioners
National Conservation Bureau
National Association of Motor Bus Operators
National Safety Council
Society of Automotive Engineers
U. S. Department of Agriculture — Bureau of Public Roads
U. S. Department of Commerce — National Bureau of Standards

Aluminum Association Recommends Standards For Kitchen Ware

Revised standards for aluminum kitchen ware, for acceptance by manufacturers, have been set up by the Standardization Committee of the Aluminum Wares Association. The committee recommends discouraging the manufacture of substandard sizes and capacities.

Minimum gauges for various sizes of baking and roasting pans, coffee makers and percolators, cooky pans, double boilers, tea kettles and tea pots, and other aluminum pans are given.

Steps should be taken to avoid trade-marking lighter goods than what is commonly known as the average standard 22 gauge line, the committee recommends, although there is no objection to using an imprint like "Pure Aluminum" or a similar imprint.

"While it is not objectionable to label goods of this kind, such labels, however, should not bear a trade-mark and should also take the quality into consideration, avoiding incorrect, misleading description, such as 'High Quality,' 'Lasting,' 'durable,' etc.," the committee says.

A copy of the committee's recommendation may be borrowed from the ASA.

Safety Code Correlating Committee Coordinates Safety Requirements

With 59 approved safety standards and 14 uncompleted projects under its direction, the Safety Code Correlating Committee coordinates the American Standards Association's work on safety requirements in many different fields. Typical of ASA methods is the fact that many of the projects under the direction of other committees, the Building Code Correlating Committee, for instance, are referred to the Safety Code Correlating Committee for advice. In this way, building code requirements and safety code requirements on similar subjects are harmonized. Safety codes affecting work in other fields, mechanical, electrical, mining, are also considered by the correlating committees in those fields.

Organizations now members of the Safety Code Correlating Committee, and their representatives, are:

L. F. Adams*, National Electrical Manufacturers Association, *Chairman

H. A. Schultz*, American Iron and Steel Institute, *Vice-Chairman

Cyril Ainsworth*, American Standards Association, *Secretary

American Gas Association, *James B. Douglas, R. B. Inman (alt.)*
American Iron and Steel Institute, *Harry A. Schultz*
American Petroleum Institute, *H. N. Blakelee, D. V. Stroop (alt.)*
American Society of Mechanical Engineers, *H. H. Judson, Dan L. Royer (alt.)*
American Society of Safety Engineers—Engineering Section National Safety Council—*A. S. Regula, E. E. Sanford (alt.)*
Association of American Railroads, *C. E. Hill*
Automobile Manufacturers Association, *David C. Fenner, William J. Cronin (alt.)*
Conference of State and Provincial Health Authorities of North America, *Stanley H. Osborn, Albert S. Gray (alt.)*
Electric Light & Power Group, *C. R. Beardsley, A. B. Campbell (alt.)*
Industrial Safety Equipment Association, *J. T. Ryan, A. O. Boniface (alt.)*
International Association of Governmental Labor Officials, *John H. Hall, Jr., T. P. Kearns, J. P. Meade (alt.)*
International Association of Industrial Accident Boards and Commissions, *W. J. Brennan, S. W. Homan (alt.), Sharpe Jones, O. B. Chapman (alt.)*
International Association of Industrial Accident Boards and Commissions, *George P. Keogh, W. H. Nickels, Jr. (alt.), Raymond C. Nicaise, B. D. Nebeker (alt.), John Roach, T. A. Wilson (alt.)*
National Association of Mutual Casualty Cos., *C. E. Pettibone, S. E. Whiting (alt.)*
National Conservation Bureau, *Walter S. Paine*
National Electrical Manufacturers Assn., *L. F. Adams, Frank Thornton, Jr. (alt.)*
National Fire Protection Association, *H. L. Miner, C. W. Rulon (alt.)*
National Industrial Conference Board
National Safety Council, *W. Dean Keefer, C. B. Boulet (alt.)*
Telephone Group, *A. B. Brown, E. S. Miner (alt.)*
U. S. Department of Commerce, National Bureau of Standards, *M. G. Lloyd, John A. Dickinson (alt.)*
U. S. Department of Labor, *William Green*
U. S. Department of Labor, Bureau of Labor Statistics, *Swen Kjaer, William H. Klinehanse (alt.)*
U. S. Department of Labor, Division of Labor Standards, *V. A. Zimmer, R. P. Blake (alt.)*
U. S. Public Health Service, *R. R. Sayers, P. A. Neal (alt.)*

Revised Recommendation for Building Units Now Before Industry for Acceptance

The standing committee in charge of Simplified Practice Recommendation R32-32, Concrete Building Units, has approved a revision of the Recommendation, and the Division of Simplified Practice of the National Bureau of Standards has mailed copies to all interests for consideration and approval.

This Recommendation lists stock sizes of load and nonload bearing block and tile and face and common concrete brick. The original Recommendation was approved at a general conference of producers, distributors, and users in 1924 and was revised for the first time in 1932.

The second revision, which is now proposed, adds four new units to the schedule of block and tile sizes.

Mimeographed copies of the proposed revision may be obtained from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

New International Committee On Welding Proposed by ISA

A new technical committee on welding of the International Standards Association has been proposed, the national standardizing body in France offering to serve as secretariat. With other national standardizing organizations, the American Standards Association has been invited to participate.

A study of the proposal reveals, however, that the project will require coordination between the work of the Advisory Committee on electric welding apparatus of the International Electrotechnical Commission, and the new ISA committee on welding.

At its meeting, April 13, the Mechanical Standards Committee of the ASA recommended that the American Standards Association signify its willingness to participate in principle in the new ISA committee and that the extent of ASA cooperation be determined by the scope of the work, which has still to be formulated. A notification of the invitation and a request for suggestions for the scope of work of the new ISA committee have been addressed by the ASA to the Compressed Gas Manufacturers' Association, the National Electrical Manufacturers Association, Class I Pressure Vessels Association, International Acetylene Association, and the ASME Boiler Code Committee. It is hoped that recommendations from these groups will be available in time for consideration at the organization meeting of the ISA committee on welding, to be held in June at Berlin. This meeting will be one of a series of meetings of ISA technical committees, announced in the March issue of INDUSTRIAL STANDARDIZATION.

British Issue New Edition Of Paint Drier Standard

Changes in the British Standard Specifications for paste driers and liquid driers for paints are included in the new edition just received by the American Standards Association.

The principal change in the standard for paste driers makes the allowance for unextracted oil 0.5 per cent in place of 0.3 per cent as it had been in the previous standards.

On the standard for liquid driers the maximum limit for volatile content is now 80 per cent whereas it had previously been 78 per cent. In addition, the composition of the paint used for determining the drying properties has been modified.

The standard for paste driers specifies composition, drying properties, color, skins and coarse particles, oil content, water, and keeping properties, and for the liquid driers volatile content, color, flash point, dilution, mixing properties, drying properties, and keeping qualities. Methods of test for these properties are also included.

Copies of the standards, BSS 331-1938 and 332-1938, in one volume, may be ordered through the American Standards Association.

Uniform Elevator Requirements Goal for New Canadian Code

Reasonable safety for persons who come into contact with elevators, dumbwaiters, and escalators is the purpose of the new Safety Code for Passenger and Freight Elevators, just issued by the Canadian Engineering Standards Association. The standard is expected to establish minimum requirements as the basis for uniform legislation for construction and maintenance of elevators, escalators, and dumbwaiters, and will probably replace previous legislation which is inadequate in view of modern elevator practice, the C.E.S.A. announces. It is also intended as a standard reference for the use of architects, consulting engineers, and elevator manufactureres and owners.

The C.E.S.A. committee which prepared the new code studied the Safety Code for Elevators, Dumbwaiters, and Escalators approved by the American Standards Association, and the Lift Code, published by the Standards Association of Australia.

Copies of the Safety Code for Passenger and Freight Elevators, C.E.S.A. B44-1938, can be borrowed or ordered through the American Standards Association, or may be ordered direct from the Canadian Engineering Standards Association, Ottawa, Ontario.

Body Measurements Study Financed by WPA Funds

The Bureau of Home Economics, U. S. Department of Agriculture, informs us that its measurement of children's sizes is being made possible through the use of WPA funds. The study was described in an article by B. S. Yane, Standards Section, Consumers' Project, U. S. Department of Labor, published in INDUSTRIAL STANDARDIZATION, April. The Bureau's findings will be used by a technical committee under the procedure of the American Standards Association as the basis for development of standard sizes for children's garments.

MAY, 1938

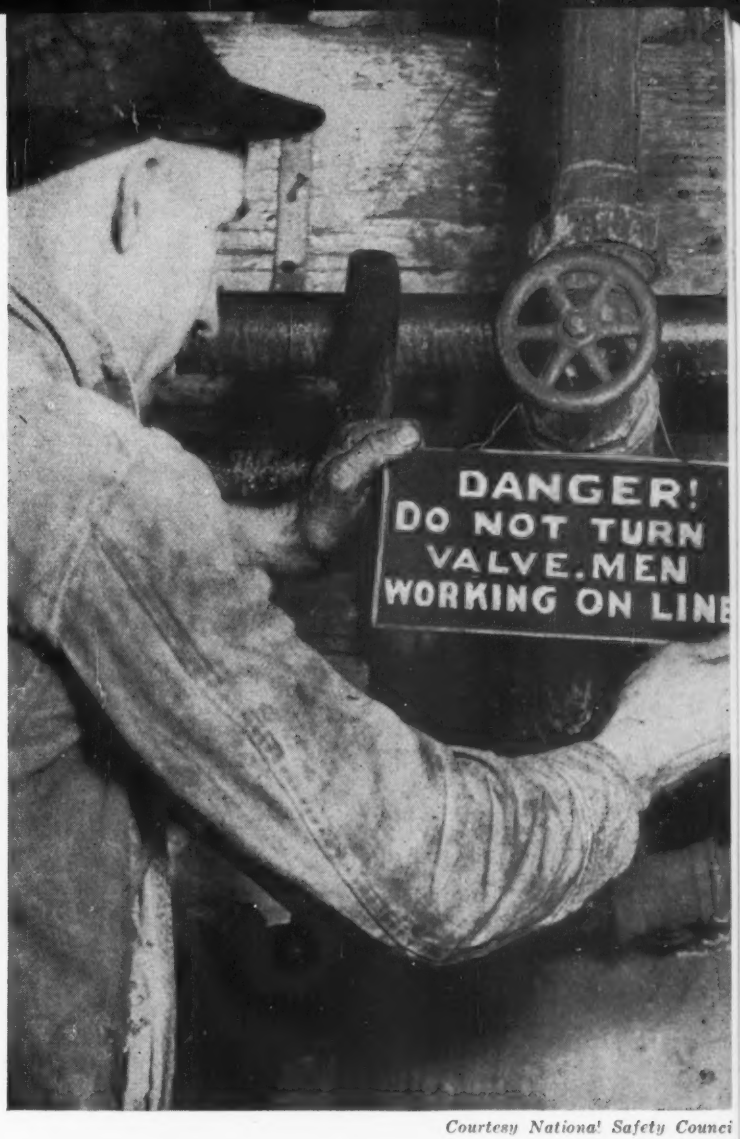
Signs—

To Carry Warning, Advise on Safety, Mark Directions

by

Mark Bulot

Safety Director,
Stonehouse Signs, Inc.



Courtesy National Safety Council

Used in safety programs from the beginning, signs have an outstanding part in accident prevention

New ASA committee will develop standards to help workers recognize each type of sign at a glance

TWENTY-FIVE years ago industrial safety was a babe in the arms of a few far-seeing men who realized this infant was to be an important personage in industrial life and needed careful guidance for a successful growth.

No other industrial development affecting all industry has risen to such heights in the short span of a quarter of a century as organized accident prevention.

Years before safety became organized, however, signs were being used in an effort to reduce accidents. They have been used to carry messages and warnings from time immemorial. It was only natural, therefore, that signs should become one of the first safety devices adopted in the accident prevention program.

There is nothing new, either, about the idea of standards for signs. Sign standards were given consideration years ago. This is shown in the Accident Prevention Bulletin, "Signs and Slogans," prepared by the Independence Inspection Bureau for the Association of American Portland Cement Manufacturers, and published in July, 1914. The opening paragraph is just as sound today as it was then. It reads:

"You can't always apply mechanical safeguards. Nor can you be present always to caution men of danger. Signs will help you. Use substantial signs—place them properly—and maintain them in a good condition."

The need for specific signs is also recognized in the following from the same: "In every plan

there is a logical need for *certain* types of signs in *certain* places." Further, "It takes careful thinking to determine the places where it is *necessary* and *desirable* to provide signs which will call attention to danger which is not obvious." The use of different colors for different purposes is also recommended.

In the August 1921 issue of *National Safety News*, C. L. Colburn, Safety Engineer, U. S. Bureau of Mines and the National Safety Council, says, "In the development of signs used in safety work, certain colors are almost standard symbols of certain conditions. Thus, red has become the sign of danger and green the sign of safety; yellow is being quite generally used in signs dealing with caution."

Other examples could be quoted, but this should be sufficient to show the value of a standard code on accident prevention signs and the need for recommended types, designs, and colors of signs for certain purposes.

What, then, should these recommendations be? What types of signs should be used for certain purposes? Here again, there is nothing new. All that is needed is official recognition of sign designs and colors that have been in use for many years, that have proved under actual service that they serve their intended purpose best, plus recommendations that these certain types of signs be used by industry.

Sign Groups

Five groups of sign designs and colors would, in our opinion, cover most of the industrial sign needs. These are:

Signs to warn of specific dangers
Signs to caution against possible hazards or unsafe practices
Signs to provide safety first instructions
Signs to provide general information
Signs to provide direction information

Everyone will, no doubt, agree that the color red should be associated with danger. But color alone is not enough. Wherever possible the word "DANGER" should be prominent in the sign. This

Standardize Signs to Help Prevent 85 Per Cent of Accidental Injuries

Standardization of safety signs to help workmen recognize warning or danger messages by color and design as well as by words has just been authorized as a project of the American Standards Association.

Eighty-five per cent of all accidental injuries can be traced to unsafe acts of persons rather than mechanical or physical hazards, statistics show. For maximum safety, reaction to signs should be automatic and workmen should not find it necessary to stop, read, and analyze the meaning of each particular warning, the National Safety Council said in requesting that the ASA start work on a national standard for industrial safety signs.

"If each sign were of standard design and color scheme according to the nature of its warning, the danger to which it called attention would be grasped more quickly," the Council explained. "There would be less chance for confusion as the sign became familiar to an increasing number of persons and those who could not read would be benefited especially."

The new standardization project will cover design, application, and use of warning signs or symbols which indicate hazards "of a nature such that failure to designate them may cause, or tend to cause, accidental injury to workers, or the public, or both."

The National Safety Council has accepted administrative responsibility for the work under the procedure of the American Standards Association. Edward R. Granniss, Safety Engineer of the National Safety Council, Chicago, is acting as secretary of the new committee, now being organized.

This article, by Mark Bulot, a member of the new committee representing the Industrial Safety Equipment Association, tells how signs have been used in the general accident-prevention program, and makes some suggestions, from the writer's experience, as to how they might be standardized.

thought naturally leads to a design. Thus, there are now two factors that will make it easy for a worker to beware of a danger—color and design. There is still another factor of equal importance and that is the sign message or wording, which should be brief, but should tell as much as possible; such as, what the danger is, where it is, and possibly how to avoid it. The wording of any message warning of danger is important not only from a safety standpoint but from a legal one as well.

Typical Danger Signs

Following are a few examples of typical danger sign wordings:

"Danger, Men Working on Line Don't Throw Switch"

"Danger, High Voltage"

"Danger, Explosives Keep Out"

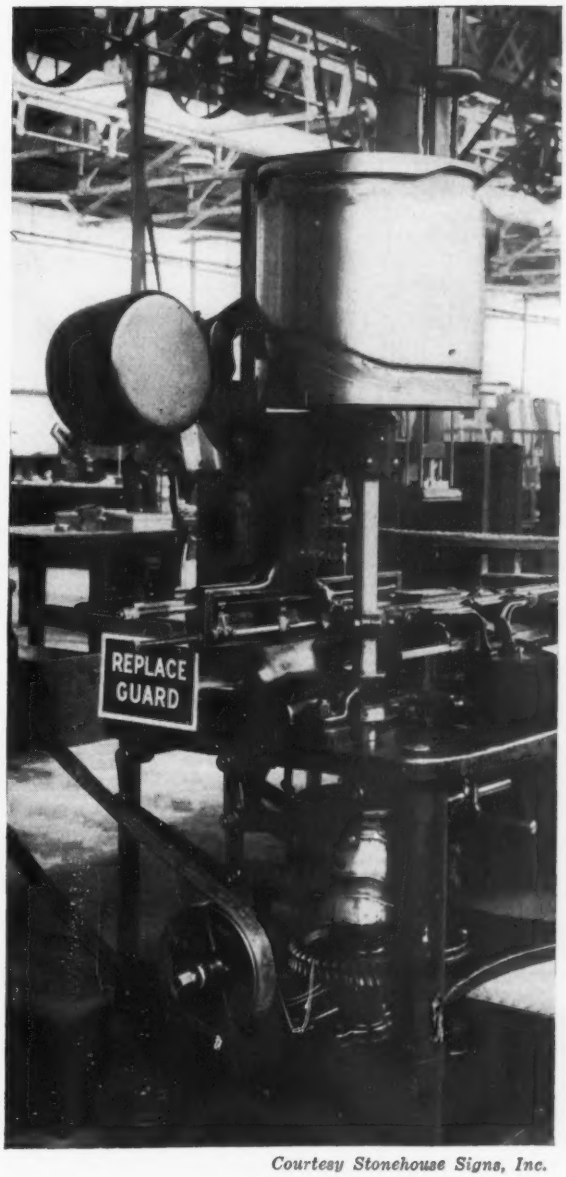
"Danger, Working on Machines Do Not Start"

"Danger, Do Not Touch Switches"

"Danger, Look Out For Cars"

"Danger, Not Room Enough Here to Clear Man on Cars"

Danger signs should be used only where an actual danger exists and should be removed when the sign is no longer necessary. This is essential if the full value of their intended purpose is to be realized. If this practice is followed, and in addition if signs of one design are used, workers will soon become familiar with the standard design of a sign which gives a warning of danger and will instinctively be more careful when they see a sign of this character. Thus, no matter where they worked they would not be confused by an unfamiliar group of signs intended to protect the same type of hazards.



Courtesy Stonehouse Signs, Inc.

Caution Signs

There are many locations in most plants where it is desirable to caution workers against a possible hazard or unsafe practice. It should be of value then to have a standard caution sign to be posted for such conditions. Again, a natural color suggests itself—yellow. This color is familiar to almost everyone as a caution color, especially since it has been so universally used for such purposes in traffic guidance. Thus, for caution signs yellow should be the predominant color with the word "Caution" prominently displayed. This can be set off from the balance of the sign by placing it in a panel at the top, the message or sign wording to appear below the caution design. Below are a few examples of caution wordings.

"Caution, Keep Aisles Clear"

"Caution, Wear Goggles When Using This Machine"

"Caution, Do Not Put Your Hands in This Press Under Any Condition"

"Caution, Don't Clean—Oil—Repair Machinery While in Motion"

"Caution, Do Not Use on Electrical Fires"

"Caution, These Doors Must be Kept Closed"

"Caution, Gates Must Be Closed on Leaving Elevator"

Courtesy Stonehouse Signs, Inc.

Caution signs, too, should be used with discretion. It is best to post them only to warn of a possible danger and to warn of unsafe practices.

One of the most important phases of every safety program is education. While, of course, this phase of safety must be handled by numerous methods, signs have been found to be of material aid. There are a number of messages that can be effectively carried to the workers this way. Often, only a small sign is needed to give instructions regarding first-aid measures and the like.

As to color for this type of sign, green just naturally comes to the front. It has long been the recognized color for safety. Thus, for this type of sign green should be the standard color and for a design it seems well to use the words "SAFETY FIRST" in a panel. The sign wording can be placed below the design. Examples of such signs are:

"SAFETY FIRST, REPORT ALL ACCIDENTS NO MATTER HOW SMALL TO YOUR FOREMAN"
"SAFETY FIRST, EVERY INJURY NO MATTER HOW SLIGHT SHOULD RECEIVE IMMEDIATE ATTENTION"
"SAFETY FIRST, PLEASE DO NOT SPIT ON THE FLOOR"
"SAFETY FIRST, WATCH YOUR STEP"
"SAFETY FIRST, RING BELL BEFORE STARTING ELEVATOR"
"SAFETY FIRST, BE CAREFUL"
"SAFETY FIRST, WALK—DON'T RUN—BETTER BE SAFE THAN SORRY"

There are some instances where it is practical to use signs for safety information and education where no particular design is used. Green should be the prominent color for such signs and they should in no way conflict with the danger or caution designs. Such signs are advisable where larger lettering is desired and signs of larger size can be used to advantage. Most such signs stand out prominently with white letters on a green background. For example:

"SAFETY SUGGESTIONS AND ANY OTHER IDEAS THAT WILL PROMOTE THE WELFARE OF WORKMEN AND THE EFFICIENCY OF THE PLANT ARE INVITED FROM ALL. DUE CREDIT WILL BE GIVEN FOR ALL SUGGESTIONS APPROVED. WRITE IT DOWN AND DROP IT IN THE BOX. BOOST FOR SAFETY"
"THE BEST SAFETY DEVICE IS A CAREFUL MAN"
"THIS DEPARTMENT HAS WORKED —— DAYS WITHOUT A LOST TIME ACCIDENT. ACCIDENTS ARE AVOIDABLE"

Notice Signs

Frequently it is desirable to post general notice signs providing instructions and advice on certain subjects and rules. In many cases such signs tie in closely with safety. The color for this type of sign should not conflict with that of other sign groups. It has been found that blue works out nicely for signs of this character. As to design, inasmuch as they are notice signs it seems well to have the word "NOTICE" prominently displayed at the top of the sign. In practice this shows up well in white letters on a blue panel. The sign wording would be desirable in black on a white background. The following are a few examples of such signs that are frequently posted:

"NOTICE, NO SMOKING UNDER PENALTY OF DISMISSAL"
"NOTICE, FOR SANITARY REASONS YOU ARE REQUESTED TO HELP KEEP THIS PLACE CLEAN. REPORT ANYTHING OUT OF ORDER"
"NOTICE, POSITIVELY DO NOT THROW ANY WASTE OR RUBBISH OF ANY KIND IN TOILET"
"NOTICE, NO TRESPASSING ON THIS PROPERTY UNDER PENALTY OF THE LAW"
"NOTICE, POSITIVELY NO ADMITTANCE EXCEPT ON BUSINESS"
"NOTICE, PUT THINGS BACK IN THEIR PROPER PLACES AND YOU WILL FIND THEM WHEN YOU WANT THEM"
"NOTICE, THIS ELEVATOR IS FOR FREIGHT ONLY—NOT FOR PASSENGERS"

It is also practical in some cases to post signs of this character where no particular sign design is used, but care should be taken to be sure such signs do not conflict with other sign group colors. Signs with white letters on a blue ground are

rather extensively used, as are signs with black letters on a white ground. This type of sign is frequently used for marking purposes. Following are a few examples:

"HELP KEEP THIS PLACE CLEAN"
"MEN"
"WOMEN"
"NO ADMITTANCE—APPLY AT OFFICE"
"NO ADMITTANCE WITHOUT PASS FROM OFFICE"
"PRIVATE PROPERTY—NO TRESPASSING"

Arrow or Direction Signs

Many accidents can be prevented and much time saved if signs providing direction information are posted properly. Such signs do, in many instances, point the way to safety and it seems advisable to use the color green in the sign design. As the purpose of these signs is to point the way to a certain location it would be well to incorporate an arrow in the design. A white arrow on a green panel has proved practical with the sign wording in and/or below the arrow. For example—

"(ARROW) THIS WAY OUT"
"FIRE (IN ARROW) EXTINGUISHER"
"TO THE (IN ARROW) FIRE ESCAPE"
"(ARROW) FIRE EXIT"
"(ARROW) HOSPITAL"
"TO THE (IN ARROW) FIRST AID"
"THIS WAY TO (IN ARROW) OFFICE"

Signs just containing the word "EXIT" are, of course, extensively used. Due to past practices these are mostly used with white letters on a red ground. It is hoped that such practice will diminish and that such signs will be posted with white letters on a green ground. It should be remembered there is nothing dangerous about exits. They provide in many cases passages to safety.

Courtesy Stonehouse Signs, Inc.

It is hoped this short discussion on sign standards will show the value of sign uniformity from an accident standpoint. The confusion caused by a miscellaneous group of signs made with little or no thought to their intended purpose is apparent. By following definite sign standards it will be possible to provide signs that will be easily understood and that will, by their colors and designs, portray to the reader a definite meaning aside from the wording they contain. It seems reaonable to suppose that this pratice will cause workers in all industries to become thoroughly familiar with sign groups and their purposes and be guided accordingly.

Gaillard to Speak on Standards July 2

John Gaillard, mechanical engineer, American Standards Association, and vice-president in charge of standardization, Society for the Advancement of Management, will talk on "The Importance of Standards", July 2, 1938, during the Eighth Annual Conference to be held at Stevens Engineering Camp, Johnsonburg, N. J., June 24 to July 2, inclusive. Dr. Gaillard's talk will form part of a series of round table discussions on "Management Education" for teachers of management, business administration, industrial engineering, and engineering economy.

Among other subjects discussed in this series are "Some Guiding Factors in Applying Management Methods" (Joseph W. Roe) and "Fred Taylor and his Philosophies" (Dexter S. Kimball).

The conference includes morning courses on Human Problems of Administration (T. North Whitehead, Harvard University), Motion and Time Study (David B. Porter, New York University), Personnel Administration (Harold B. Bergen), Industrial Management (George W. Barnwell, Stevens Institute), several talks on Broader Problems of Management and lectures by prominent business executives. Afternoons will be free for recreation and sports.

Details may be obtained from Stevens Institute of Technology, Hoboken, N. J.

A.S.T.M. Annual Meeting To Be June 27-July 1

The Forty-first Annual Meeting of the American Society for Testing Materials will be held at Chalfonte-Haddon Hall, Atlantic City, N. J., during the week of June 27 to July 1. Some 18 sessions will cover the 100 technical papers and reports which are being scheduled. Papers and reports covering specific fields and topics will be grouped together.

Outstanding feature of the meeting will be a Symposium on Impact Testing, which is being developed jointly by the A.S.T.M. and the American Welding Society through its Welding Research Committee.

Other sessions will include a series of papers on water for industrial uses; a series of papers on radiographic testing; properties of metals as affected by temperature and fatigue; and physical properties of four low-alloy high-strength steels, and surface cracks on large 18 per cent chromium, 8 per cent nickel alloy steel castings. The annual reports of Committee A-5 on Corrosion of Iron and Steel and Committee B-3 on Corrosion of Non-Ferrous Metals and Alloys will include data developed in their research programs. There will also be papers on non-metallic materials, including a discussion of the freezing-and-thawing test for building brick, and effect of shape of specimens on the apparent compressive strength of brick masonry.

Other subjects will include the effect of sulfur on the properties of asphalts, the uses of statistical methods as an aid in revising specifications, examination of metals in polarized light, the oxidation of mineral transformer oil, and an accelerated test for determining chemical stability of lubricating greases.

Air Hygiene Foundation To Study Industrial Diseases

The Air Hygiene Foundation of America is extending its research activities to industrial diseases resulting from dusts and fumes.

This program of medical and engineering research, according to H. B. Meller, Managing Director of the Foundation, is to include: Determination of the causes and prevention of diseases from dusts and other air pollution; methods of safeguarding workers' health; reduction of silica dust hazards; further study of chest roentgenology; and reducing of pneumonia rate in smoky atmospheres.

The Foundation will cooperate in its studies with the Saranac Laboratory, the Harvard School of Public Health, the University of Pennsylvania Hospital, the Singer Memorial Laboratory, the Mellon Institute for Industrial Research, and the U. S. Bureau of Mines.

Federal Specifications Received by ASA

Copies of new and revised Federal Specifications for use in all Government purchasing, received recently by the American Standards Association Library, are listed below.

Aluminum-Alloy (Aluminum-Manganese); Bars, Rods, Shapes, and Wire QQ-A-356a
Baskets, Desk; Steel (Strip and Wire) RR-B-131
Biscuit and Short-Bread-Mixtures; Prepared N-B-371
Bolts, Lag; Steel (Lag-Screws) FF-B-561
Bread and Rolls EE-B-671a
Brick; Paving SS-B-671a
Broadcloth; Cotton, Mercerized CCC-B-686
Bunting; Cotton, Mercerized CCC-B-791a
Cloth; Shade CCC-C-521a
Cloths, Table; Cotton DDD-C-481a
Cloths; Wash, Turkish DDD-C-486
Cloths, Wiping; Cotton, Mixed and White, Sterilized, (for) Machinery DDD-C-503
Cots; Folding, Canvas AA-C-571a
Cream; Fresh C-C-671a
Damask, Table; Cotton (in Bolts) CCC-D-71
Doughnut, Pancake, and Waffle-Mixtures; Prepared N-D-591
Excelsior (Wood) NN-E-911
Fencing; Chain-Link or Welded RR-F-191
Fittings; Cable and Conduit W-F-406
Folders; File (Calendered), Vertical UU-F-571a
Gelatin, Dessert-Powder and Plain; and Starch-Dessert Powder C-G-191a
Grinders; Bench, Electric W-G-656
Hardware, Builders'; Door-Closers FF-H-121a
Insulation; Bat or Strip-Form and Loose-Fill HH-I-521b
Laundry Appliances OO-L-131b
Metals; General Specification for Inspection of QQ-M-151a
Mowers; Lawn, Power OO-M-681
Outlet-Bodies; Iron (Cast or Malleable), Cadmium or Zinc-Coated, with Covers and Accessories, (for Shore Use) W-O-806
Outlet-Boxes; Steel, Cadmium or Zinc-Coated, with Covers and Accessories W-O-821a
Paint; Ready-Mixed, International-Orange TT-P-59
Paper; General Specification UU-P-31a
Paper; Toilet, Tissue, Roll (Round and Oval) and Sheet UU-P-556h
Shears; Roaching GGG-S-286
Soap; Soft, Potash-Linseed-Oil P-S-613
Steel, Structural; (for) Bridges QQ-S-711a
Steel, Structural; (for) Buildings QQ-S-721a
Tape (Taste); Silk DDD-T-126
Tile; Cork LLL-T-431
Union-Suits; Boys' and Men's, Nainsook DDD-U-551
Valves, Radiator; Air, Thermostatic (Gravity Steam-Heating Systems) WW-V-151

Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at five cents for all except the Specification for Laundry Appliances, OO-L-131b, which is ten cents.

Economy and Speed of Heating Emphasized In Revised Standards for Hotel Ranges

Research by American Gas Association Testing Laboratories Gives Data on Efficiency of Ranges, Basis for New Requirements

by

Franklin R. Wright

American Gas Association
Testing Laboratories

ONE of the most important factors in making a standardization program effective is periodic revision of standards in line with the latest developments in design, construction, and performance.

The American Gas Association, sponsor for the ASA project on Gas-Burning Appliances (Z21), follows a policy whereby requirements for various types of gas appliances and gas appliance accessories are revised and brought up-to-date periodically. In line with this policy, a revised edition of the Approval Requirements for gas-operated hotel and restaurant ranges was prepared during 1936 and early 1937, approved as American Standard in October, 1937, and revisions to the revised standard were approved as American Standard in March, 1938.

In preparing the 1937 revision, extensive research was carried on by the A.G.A. Testing Laboratories for the committees in charge. After approval of the revised standard in October, 1937, research, dealing with efficiency of solid-top and fry-top hotel and restaurant ranges, was continued during the latter part of 1937, and additional requirements completed. Believing that these additional requirements should be included in the published standard, the committee referred them to the American Standards Association for endorsement. They were approved as American Standard on March 3rd.

The latest edition of the standards is much more comprehensive and rigid than the earlier edition issued late in 1932. It includes approximately twice as many requirements and stipulations as were previously specified, as well as additional construction and performance requirements to insure better and more satisfactory ranges from the standpoint of construction, durability, and performance.

Minimum efficiency requirements were added for open-top, fry-top and solid-top ranges which should insure satisfactory economy in operation. A Performance Requirement limiting the amount of gas required to maintain temperatures in hotel and restaurant range ovens was included. Performance Requirements were added insuring speed of heating of broilers, and similar provisions applying to ovens were strengthened.

The standards were also expanded to cover hotel and restaurant ranges for use with propone gas, commonly known as bottled gas, and butane-air gas. These additions were made in order that certified ranges might be available for roadside stands, small communities beyond the reach of city gas mains, and for villages where natural or manufactured gases are not available, but which are now supplied with butane-air.

Correlated with Accessory Requirements

The requirements have been extensively correlated with the various American Standard Listing Requirements for gas-appliance accessories. In 1931, the American Gas Association decided to extend its certification program to various types of gas-appliance accessories, such as burner valves, draft hoods, domestic gas-appliance pressure regulators, thermostats, and many other types of accessories commonly used on gas appliances. Subcommittees of the ASA sectional committee

Where hotel and restaurant ranges are tested. The American Gas Association's Testing Laboratories, Cleveland

and the A.G.A. Approval Requirements Committee were organized to draft detailed construction and performance standards for such accessories. To differentiate the accessory standards from those applying to complete gas-burning appliances, they were termed "Listing Requirements" rather than "Approval Requirements." In other words, Approval Requirements apply to complete gas-burning appliances, whereas, Listing Requirements apply only to accessories which depend to some extent for their safe and satisfactory performance upon the method and manner of their installation.

Installation Important

A hotel and restaurant range, for example, is certified for compliance with American Standards as a complete gas-burning unit. In certifying a thermostat, however, it is not possible at the time to determine just how, eventually, that thermostat will be installed in an oven. When a thermostat is installed properly it will, of course, function satisfactorily. It might, however, be installed in an oven in such a way that it would not register and regulate temperatures properly. The Listing Requirements cover the details of design, construction, and performance of thermostats, the performance requirements being applied under conditions stimulating actual service. These Listing Reguirements are then referred to and made a part of the Approval Requirements, which also require additional tests with the thermostat installed on the range in the way provided by the manufacturer. In this manner the two standards are tied in together to protect the ultimate consumer by providing not only that the accessories are inherently correctly designed and durable, but also that their performance is satisfactory as applied to a particular appliance.

Space does not permit a detailed discussion of all of the various revisions and additions to the hotel and restaurant range standards. It may be said, however, that nearly every one of the previous requirements was revised and strengthened, while a number applying to both construction and performance were added. Several of the latter type are of particular interest.

In general, the revised standards for hotel and restaurant ranges follow along the same general lines as the American Standard Approval Requirements for Domestic Gas Ranges (Z21.1-1937). In many instances provisions as to construction and performance, particularly of parts and accessories, are the same for both domestic ranges and hotel and restaurant ranges. However, due to inherent differences in the functions of hotel and restaurant ranges as compared with domestic ranges, coupled with differences in their manner of use, there are, naturally, certain differences in some of the Performance Requirements. Hotel and restaurant ranges are, of course, designed for and subjected to heavier duty than domestic ranges, and greater weights of material and strength of parts are required for them than for domestic ranges. As an example, grates of hotel and restaurant ranges are subjected to a load of 300 pounds applied over an area of only 9 inches in diameter at the center of the grate. In the

case of solid-top ranges, a load of 800 pounds is applied over an area of only 16 inches in diameter at the center of the top. In addition, a load of 800 pounds is applied to the two weakest members of the top of the range to insure rigid frame and body construction. In the case of domestic ranges, a load of only 300 pounds is applied on the top. Likewise, dropped doors of domestic ranges are required to withstand a load of 100 pounds without damage or breakage of any part, but in the case of hotel and restaurant ranges of the heavy-duty type, the load is 400 pounds and for light-duty types 200 pounds.

Since 1933 more than 368 models of hotel and restaurant ranges have been certified by the American Gas Association Testing Laboratories as complying with the American Standard Approval Requirements. As with all gas appliances approved by the American Gas Association, certified hotel and restaurant ranges are required to display the Laboratory Seal of Approval—a 5-pointed blue star inscribed within two concentric circles and bearing the inscription, "Complies with National Safety Requirements. Approved. American Gas Association."

The standardization work on hotel and restaurant ranges, similar to the testing and certification program carried out on all domestic gas appliances during the past 12 years, has proven of inestimable value not only to producers and utility companies but to the purchasers and users of such equipment. At the present time, the great majority of hotel and restaurant ranges offered for sale have been certified in accordance with American Standards and bear the familiar Laboratory Approval Seal.

How Mass Production, Standardization Lower Costs, Raise Living Standards

Use of modern machinery has brought down prices and thereby raised the standard of living, is the theme of a booklet, *More Goods for More People,* published recently by the National Machine Tool Builders' Association. Through production costs the Association shows how industry can afford to sell mass-production products at present prices. Industrial standardization, basis for the methods used in manufacturing high-grade products in large volume at high speed, takes a prominent place in the picture. The following examples are taken from the booklet:

A high-grade radio now retailing for $100 would have to be sold for $1000 if it were made without the aid of the mass-production facilities now employed.

Stoves, refrigerators, and washing machines would cost anywhere from six to ten times what they do today if the plants manufacturing them were not tooled with modern equipment.

Precision looms of a type that were not available a few years ago reduce weaving costs from 15 to 30 per cent. Without this improvement in looms, the selling prices of fabrics for men's and women's clothing would be much higher than they now are.

By reducing the use of labor per 1000 pounds of produce shipped by 40 per cent from 1914 to 1935, Swift & Company increased the number of people employed from 23,654 in 1914 to 31,527 in 1935.

"Except for modern production methods," says Louis Ruthenberg, president of Servel, Inc., "automatic refrigeration would cost so much as to command an extremely limited market."

Mass-production methods have been used almost from the beginning in the telephone industry, and without such methods there actually would not have been any telephone service.

Mr. Chrysler estimates that a modern automobile selling for $600 would cost $3,500 if made by the methods available some 30 years ago.

Furniture in our homes and offices would cost approximately four times as much as it does today if present machinery and methods were discarded. estimates F. Stuart Foote, secretary-treasurer of the Imperial Furniture Company, whose computation is based on carefully kept records of the cost of producing small quantities for sample purposes.

Germany Standardizes on Ten Types of Rubber Tires

Negotiations on standardization of rubber tires have been concluded between the German manufacturers and the motor industry, according to a news item in the *India Rubber Journal*, London, November 6, 1937. For passenger vehicles, the article says, there will in future be only ten types, instead of 37 as formerly. The standard tire will be the 16 in., with a 20-in. tire for light vans, and a 22 in. for heavy trucks.

Dr. Dryden, technician of the National Bureau of Standards, tells ASA Building Code Correlating Committee how research work supplements experience in finding facts used by committees as basis for standard requirements

Building Codes Combine Facts and Judgment[1]

by

H. L. Dryden

National Bureau of Standards

A SATISFACTORY building code is compounded on a basis of technical facts and the composite judgment of interested parties as to the degree of safety practicable and the measures necessary to obtain it.

A research program has as its object the determination of these technical facts. Matters of opinion must be referred to a larger group representing many interests and points of view, such as a sectional committee of the American Standards Association.

To illustrate this division of responsibility between the research agency and the correlating agency, an example may be quoted:

The National Bureau of Standards has completed a study of the technical facts on which recommendations for the protection of plumbing systems against back-siphonage should be based.

This report, "Cross Connections in Plumbing Systems," appeared in the April issue of the *Journal of Research* of the Bureau, and deals only with the technical phases of the subject. It contains a brief history of past work, an analysis of the limiting values of conditions tending to cause back flow, a classification of cross-connections, an analysis of proposed means of preventing back-flow, and a determination of minimum requirements for the positive prevention of back-flow under maximum or limiting conditions in the system. It contains no suggested regulations. Their formulation, involving a determination of what degree of protection is desirable and practicable, is the task of the Sectional Committee on Standardization of Plumbing Equipment (A40) of the American Standards Association.

A research program is a means of achieving more quickly a wider experience than is possible in the slow process of service experience. The controlled experience of the laboratory is supplementary to the experience obtained through service, and is not a complete substitute for it. By living in houses built of certain materials for periods of 25 or 50 years, experience is slowly accumulated, but if no other method of judging the performance of materials and structures is available, progress is necessarily very slow.

Compare the development of our newer industries, for example the automobile and aircraft industries, with the building industry. Both of the former rely heavily on scientific and technical personnel and are constantly engaged in attempts to develop better and cheaper methods of construction. The organization of the industry is such that numerous adequately financed groups assume responsibility for the vehicle as a whole. By contrast, the building industry relies mainly

[1]Abstract of talk given before a meeting of the Building Code Correlating Committee, March 25, 1938.

on the slow service experience of the past, and has within it few, if any, laboratories concerned with the experimental development of houses.

The practices with regard to the inspection of automobiles or airplanes as to safety are in sharp contrast to those dealing with the inspection of buildings. The requirements for airplanes are stated in terms of performance to be secured and there are few restrictions on the type of material or method of assembly used. Approval of new materials, new methods of design, and new methods of assembly rests largely on suitably chosen performance tests.

The National Bureau of Standards is placing considerable emphasis in its research program on building materials, on the development of suitable performance tests for house constructions as a possible basis for evaluation of the merits of new constructions. It is not too much to hope that the development of such tests may influence the writing of building regulations in terms of performance rather than in terms of detailed descriptions of traditional types of construction.

"Building codes are founded on experience. Research is controlled, directed, and accelerated experience. A research program on building materials and structures is, therefore, destined to play an important part in the shaping of building codes."—*Dr. H. L. Dryden.*

U. S. Delegates to Attend International Meetings

The United States will be represented through the United States National Committee at the triennial plenary meeting of the International Electrotechnical Commission to be held in England this summer. Technical meetings will be in Torquay, June 22 to June 30. The formal closing session will be in London, July 1.

The chief American delegate will be Dr. C. H. Sharp, president of the U. S. National Committee. J. W. McNair, secretary of the U. S. National Committee, will be secretary of the delegation.

Subjects to be covered at the technical meetings, and delegates of the USNC who will attend, are listed below:

Subject	*IEC Advisory Committee*	*Delegate*
Accumulators	21	F. B. Silsbee
Aluminum	7	Delegate to be determined later
Electric Cables	20	W. F. Davidson
Electric & Magnetic Units	24	F. B. Silsbee; C. H. Sharp
Electric Traction Equipment	9	Joseph Slepian; P. W. Forsberg; J. H. Rechangle
Electric Welding	26	P. L. Alger; R. M. Gooderham
Electronic Devices	22	Joseph Slepian
Graphical Symbols	3	S. A. Moss; J. W. McNair
Internal Combustion Engines	19	Francis Hodgkinson; Paul Diserens; C. B. LePage; I. E. Moultrop; S. A. Moss
International Vocabulary	1	F. B. Silsbee; C. H. Sharp
Lamp Caps and Holders	6	L. F. Adams
Letter Symbols	25	S. A. Moss
Measuring Instruments	13	F. B. Silsbee; W. F. Davidson
Overhead Lines	11	C. A. Powel; W. F. Davidson
Radio Communication	12	F. Muller
Shellac	15	L. F. Adams
Standard Voltages and Currents	8	C. A. Powel; F. Attwood; M. Henriod
Steam Turbines	5	Francis Hodgkinson; Paul Diserens; C. B. LePage; I. E. Moultrop; S. A. Moss; Geo. A. Orrok; Geo. A. Stetson
Switchgear	17	P. L. Alger; C. A. Powel
Terminal Markings	16	L. F. Adams
Transformers (Section B of Committee 2)	2	P. L. Alger; L. F. Adams

Dr. C. H. Sharp will be delegate to both the IEC Council and Committee of Action.

James Burke, president of the International Electrotechnical Commission, and for many years a member of the U. S. National Committee, will preside at the general sessions of the IEC. Mr. Burke was elected president at the last plenary meeting, Brussels, 1935.

New Committee Organizes To Develop Bedding Standards

HOW to make information about filling materials in bedding and upholstered furniture readily available to retailers and consumers was discussed at the first meeting of the Sectional Committee on Standards for Bedding and Upholstery, April 21. J. Davis Donovan, chief of the Legal Division, Maryland Department of Health, and president of the National Association of Bedding and Upholstery Law Enforcement Officials, was chairman of the meeting.

The committee agreed that its first work should be devoted to terminology and definitions, as well as grades and methods of test for filling materials.

Nine subcommittees to handle the problems before the committee were authorized:

Methods of Test—Warren E. Emley, National Bureau of Standards, Washington, D. C., *Chairman*
Sterilization—Ephraim Freedman, Bureau of Standards, R. H. Macy & Co., New York, *Chairman*
Cotton, Cotton Linters, and Mill Waste—Cecil Kutz, American Cotton Waste Exchange, Boston, Mass., *Chairman*
Wool and Other Animal Fibers (excluding hair, feathers, and down)—J. Reid Johnson, Palmer Bros. Co., New London, Conn., *Chairman*
Miscellaneous Filling Materials—E. R. Ruthenberg, Atlantic Excelsior Co., New York, *Chairman*
Feathers and Downs—I. Buchman, L. Buchman Co., Inc., Brooklyn, N. Y., *Chairman*
Metal Beds and Springs—Ben Frank, Greenpoint Metallic Bed Co., Brooklyn, N. Y., *Chairman*
Inner Springs—S. Marcus, Spring Products Corp., Long Island City, N. Y., *Chairman*
Hair (Horse, Cattle and Hog)—H. B. Sweatt, National Association of Curled Hair Mfrs., New York, N. Y., *Chairman*

A subcommittee on uniform tags was also considered but its organization was postponed until after some of the above subcommittees have made progress with their assignments.

Fourteen members of the sectional committee have already named representatives. They are:

National Bureau of Standards—Warren E. Emley
American Home Economics Association — Ruth O'Brien; Alice L. Edwards (Alt.)
U. S. Dept. of Agriculture, Bureau of Home Economics—Ruth O'Brien
National Association of Bedding and Upholstery Law Enforcement Officials—Mary A. McInroy; Fred A. Taylor; J. Davis Donovan; H. B. Starr, Jr. (Alt.); Hermann C. Lythgoe (Alt.)
New England Bedding Manufacturers Association—Samuel Rosenberg
National Association of Curled Hair Manufacturers—H. B. Sweatt
American Association of University Women—Ruth Ayres
Maryland and District of Columbia Bedding Board of Trade—C. E. Lenz
American Cotton Waste Exchange—Cecil Kutz
Supply Men's Club—Reuben Binkovitz
Bedding Division, N. Y. State Dept. of Labor—L. A. Havens; E. Freedman (Alt.)
National Association of Bedding Manufacturers—L. Gerald Koch; J. H. Williams; S. J. Mills
General Federation of Women's Clubs—Julia K. Jaffray
National Retail Dry Goods Association—E. Freedman
National Bedding and Upholstery Manufacturers Board of Trade—Morris Chorost; Charles Stoll (Alt.); Harry Schimmel; Ben Spewack (Alt.); Samuel Marcus; George Holmes (Alt.)
Bedding Manufacturers Board of Trade, Inc.—Irving Buchman; Emanuel Licht (Alt.); Ben Frank; Max Englander (Alt.); Arnold W. Becker
National Association of Furniture Manufacturers—A. P. Haake

Organizations which have been invited to appoint representatives are: Associates for Government Service; National Retail Furniture Association; National Congress of Parents and Teachers; National League of Women Voters; Consumers' Project, U. S. Department of Labor.

Ball Bearing Standards In One Volume

Three standards for ball bearings approved by the American Standards Association have just been published in a single pamphlet. They are:

American Standard Annular Ball Bearings—Single Row Type and Separable (Open) Type (B3.1-1933)
American Recommended Practice Annular Ball and Roller Bearings—Wide Type (B3.2-1930)
American Standard Angular Contact Type Ball Bearings (B3.3-1933)

Copies of the new pamphlet are available at 40 cents each.

Safety Code for Power Presses, Published by ASA, for Sale

The Safety Code for Power Presses and Foot and Hand Presses, re-issued with a few minor changes, and approved by the American Standards Association in October, 1937, is now available. The National Safety Council has the administrative leadership for the work of the committee in charge of the code.

Copies of the standard, B11-1937, are available from the American Standards Association at 50 cents each.

Revision of Radio Standard Extends Safety Requirements to Other Devices

by

J. W. Fulmer

Assistant Electrical Engineer,
Underwriters' Laboratories, Inc.

The Standard for Power-Operated Radio Receiving Appliances, sponsored by Underwriters' Laboratories, Inc., was given approval by the American Standards Association in December, 1936. Recently, a number of changes in and additions to that standard were referred to the American Standards Association, approved in March, 1938, and a new edition issued in April.

This article briefly discusses some of the factors which prompted these revisions and the benefits to be derived, insofar as a reduction of fire and accident hazards is concerned.

THE Standard for Power-Operated Radio Receiving Appliances, originally intended to assure safety from fire and accident hazards for electrically operated radios such as those used in homes, has now been extended to cover the same features of other non-commercial sound equipment. This includes relatively low-powered, inter-communicating systems, record players, and similar devices.

This standard provides requirements for the enclosing case or cabinet, the supply circuit, transformers, capacitors, wiring, accessibility of live parts, spacings between parts, fuses, power consumption, temperature, dielectric strength, rating, and marking.

Another change in the standard provides a new statement in the material on "Enclosure" to the effect that "Motor windings, and other coil windings which are not affected electrically (overloaded) by the failure of other parts are not required to be enclosed individually."

If an enclosing case or cabinet is constructed of combustible material, individual units such as reactors and capacitors conductively connected to the power-supply circuit are required to be enclosed in non-combustible material. This parallels the requirements that a tranformer which is connected to a power-supply circuit shall be completely and individually housed in non-combustible material. This was based on a thorough investigation of many makes and designs of power transformers, which showed that, depending upon the extent to which a power transformer is overloaded, there may be a decomposition of the impregnating compounds and other organic materials present. This produces gases which, when mixed with the proper porportion of air, are explosive and are likely to be fired by sparks attendant with the opening of the transformer windings.

Motors used in radio receivers for driving phonograph turntables, turning mechanisms, or used for similar applications, are generally of the induction type. Windings of that type of motor are not provided with individual, non-combustible enclosures; but the characteristics of such motors are such that the stalled-rotor load practically never exceeds 110 per cent of the normal motor load. Furthermore, this particular type of phonograph motor is arranged in a circuit that is not likely to be overloaded as the power transformer may be. Accordingly, the change in the standard was based on the freedom from overload of phonograph motor windings, and the absence of field reports of failure of phonograph motors.

A new requirement is included under the caption "Supply Circuit" stating that "The power-supply cord shall be provided with a knot or equi-

valent stop which will prevent the cord from being pushed inside the chassis."

Generally, strain relief for the cord is provided by a knot tied in the cord and butting against the power-cord bushing. While this arrangement prevents the transfer of any tension on the cord to the terminals which receive the cord, it does not prevent an objectionable flexing of the power-cord conductors within the chassis when the cord is pushed into it. Accordingly, the addition of the knot in the cord at the outside of the chassis reduces the amount of flexing of the cord at the terminals, particularly when the distance between the receiver and the convenience outlet would permit some reduction in cord length and where the user might attempt to push the cord into the chassis.

Lead Openings for Power Transformers

Under the caption "Transformers", an earlier requirement referring to the lead openings in the power transformer has ben revised to indicate that "The enclosure shall not be provided with holes or louvres which will allow the circulation of air, except holes for the entrance of wires. The unused portion of any hole in the enclosure for the leads to the transformer shall not be larger than 0.2 sq in. in area; and the total unused portion of two or more holes shall not be larger than 0.35 sq in. in area. Any hole provided in the transformer for lead wires, but not so used, shall be effectively closed with noncombustible material."

The basic requirement permitted some degree of venting for the escape of gases which may form as a result of heating of the transformer windings; and the relatively small amount of opening at the point where the leads emerge from the transformer enclosure was believed to fulfill this phase of the construction. Variations in the size of the lead opening, when considered in conjunction with various numbers and sizes of leads brought out of these openings, indicate that they are frequently in excess of the area necessary for the venting of gases. Consequently, the number of openings and the unused area of those openings is specified in order to reduce the probability of ignition of the gases within the confines of the power transformer.

Insulating Tubing

In connection with the requirements under "Wiring", a new specification has been added indicating that "Insulating tubing (frequently referred to as 'spaghetti') employed in a radio receiver shall not be readily combustible."

Insulating tubing employed in radio receivers has been found on a number of occasions to contain an appreciable amount of cellulose nitrate. Recognizing the high endothermic properties of this material and its relatively low ignition point, it was considered to be entirely appropriate to reduce the fire hazard of radio receivers by limiting the use of highly imflammable materials.

Electrical Isolation Capacitors

In connection with the requirements for "Accessibility of Live Parts", there appears a new statement to the effect that "Electrical capacity of more than 0.25 microfarad from either side of the line to the chassis, or more than 0.1 microfarad from either side of the line to the antenna and/or ground connection is not considered to be acceptable."

Radio receivers, to be saleable, must be as free as possible from noises, squeaks, and howls. Interference of this nature may be traced to improper circuit design and the "antenna effect" of the power-supply circuit beyond the confines of the receiver. It has been found that the electrical requirements with respect to stable operation, hum reduction, and attenuation of the power-supply circuit as an "antenna system" are satisfied in most cases by the use of the by-pass capacitors connected from the power-supply circuit to the chassis and having a capacitance of no more than 0.25 microfarad. Likewise, experience has indicated than any incoming or outgoing terminals or leads such as antenna and ground connections may be isolated with capacitors having a capacitance of no more than 0.1 microfarad.

Pilot-Lamp Socket Terminals

In the further interest of reduction of fire hazards, a requirement appears under "Accessibility of Live Parts" stating that "Live terminals of a panel or pilot-lamp receptacle shall be protected or fixed so that the possibility of grounding in use or in service is remote."

In the a-c type of receiver with the transformer winding not conductively connected to the power-supply circuit, and supplying current for the operation of pilot lamps, very little attention was paid to the construction of the socket or receptacle, chiefly because of its connection to nominal 6-volt circuits involving no serious shock hazard. The fact that the windings to which the socket or receptacle is connected, are likely to provide hazardous energy, coincident with the fact that the socket or receptacle may be removed for tube servicing from the bracket supporting it, suggest that a fire hazard exists upon short circuit of the terminals. Accordingly, the need was felt for the requirement of an adequate barrier which would practically preclude the possibility of short circuiting the terminals during servicing of the pilot lamp.

A detail covering the design of audio-frequency transformers, appearing under "Accessibility of Live Parts", indicates that "A covering of tough, insulating material not less than 1/64 in. in thickness is considered to be acceptable for a primary conductor brought out to an external protected splice."

In general, live parts connected in secondary circuits and involving potentials of 300 volts or more are required to be protected with insulation at least 1/32 in. thick. The relatively small area occupied by the enameled-wire lead at the face of the winding, considered in conjunction with unusual problems in coil design, suggested that the requirement might be modified to accept a lesser insulation thickness, but nevertheless a construction substantial in design for the area to be protected.

With regard to the test program for radio receivers, a new requirement has been added under the caption "Dielectric Strength", stating that "A separable connector, such as in dynamic-speaker circuit, shall be capable of performing acceptably without injuriously affecting other parts of the device, when subjected to a test consisting of ten cycles of make and break, in a period of one minute, with full primary input voltage applied to the device."

An analysis of the use of separable connectors, such as in dynamic speaker circuits, warrants the investigation of these devices under a test program which will determine the adequacy of the connector for controlling a particular load. The test also safeguards the receiver against the effects of transient voltages on other devices in the associated circuits caused by the connection and disconnection of the separable inductive or resistive loads.

New Test Specifications From Australia

Among the new standards of other countries now filed for the use of ASA Members in the American Standards Association Library are the following "test specifications" just received from the Standards Association of Australia:

Electric bread toasters, C101-1937
Electric grillers, C102-1937
Electric radiators, C103-1937
Electric portable immersion heaters, C104-1937
Electric kettles and saucepans, C105-1937
Electric jugs, C106-1937
Electric irons, C107-1937

Copies of these standards may be borrowed or ordered from the Library of the American Standards Association. When ordering standards members are requested to mention the serial number.

Revision to Standard Proposes Exception To Marking Gold-Filled Articles

A revision to exempt field pieces of lockets from the provisions of the Commercial Standard for Marking Gold Filled and Rolled Gold Articles Other than Watchcases is being circulated by the National Bureau of Standards for acceptance by the industry. The manufacturing jewelers state that it is impracticable to make the field pieces of lockets of rolled gold plate material. "If rolled gold plate is used," they say, "the gold is faced off in the operation necessary to obtain a close fit between the two halves of the locket. In the absence of an exemption for field pieces, it has been customary not to mark lockets for quality, which leaves the market open to unfair competition, and the consumer has no means of knowing what he is buying."

In its original form the standard, CS47-34, was approved by the American Standards Association as an American Standard (Z31-1933).

ASA Withdraws Project On Zinc and Zinc Ores

The Standards Council voted at its last meeting to withdraw the project on Zinc and Zinc Ores (H1), which was organized in 1920. The action was taken at the request of the joint sponsors, the American Zinc Institute and the American Society for Testing Materials, which reported that recent investigations had shown little need for the proposed standard.

Index to British Standards

The 1938 Index to British Standards has just been received by the American Standards Association. It includes lists of:

British Standards (listed by subjects, and in numerical order)
New British Standards in course of preparation
British Standard Methods of Test

It also includes a statement of the aims and objects of the British Standards Institution and other information about the BSI and the organizations cooperating with it.

Copies of this 150-page book, in heavy paper cover, may be ordered through the ASA office.

A.S.T.M. Organizes New Committee To Study Radiographic Testing

More effective work on radiographic testing is the purpose of a new standing committee just organized by the American Society for Testing Materials, Committee E-7 on Radiographic Testing. H. H. Lester, Watertown Arsenal, has been elected chairman, and Earnshaw Cook, American Brake Shoe and Foundry Company, secretary, of the new committee.

The list of subcommittees which are in course of formation indicates the general scope of the work:

Radiography of Cast Metal—C. W. Briggs, American Foundrymen's Association, *chairman*
Technical Research—H. E. Seemann, Eastman Kodak Company, *chairman*
Radiography of Welds and Weldments—H. H. Lester, Watertown Arsenal, *temporary chairman*
Correlated Abstracts—W. P. Davey, Pennsylvania State College, *chairman*
Safety—E. W. Page, General Electric X-ray Corp., *chairman*
Programs—Lars Thomassen, University of Michigan, *chairman*

The new committee expects to hold a meeting in June during the A.S.T.M. Annual Meeting in Atlantic City. One of the main features of the meeting is to be a technical session at which several papers on radiographic activities will be presented.

American Home Economics Association Announces Program For Annual Meeting

Between two and three thousand home economics experts will gather in Pittsburgh at the 31st annual meeting of the American Home Economics Association, June 28 to July 1, to discuss problems under the general theme "Long-time Planning in Home Economics", the A.H.E.A. announces.

Interspersed with such subjects of practical interest to homemakers as grading and informative labeling of foods, specifications for textiles and household equipment, and family health and nutrition, will be discussion of education for family living in a democratic society, pending legislation affecting home and schools, utilizing home economics in social welfare and public health work, and effective consumer organization.

A number of addresses and round-table discussions will center on the national low-cost housing program and the importance of improved housing standards in family welfare.

Homemakers as consumers will hold the center of the stage at several sessions. Activities of the Association on behalf of consumers, including the program of consumer education and co-operation with distributors and producers through the American Standards Association and the recently organized Consumer-Retailer Relations Council, will be reported upon, and plans made for the future. Speakers on consumer problems include D. E. Montgomery, consumers' counsel of the Agricultural Adjustment Administration; Dr. Day Monroe of the U. S. Bureau of Home Economics, who will report on the findings of the recent Consumer Purchases Study; Mrs. Della T. Lutes of Holliston, Massachusetts, author of "The Country Kitchen"; and Dr. Pauline Beery Mack of Pennsylvania State College, a leader in the movement for providing the homemaker with adequate information on textiles by a system of informative labeling.

Other topics featured on the program are child health; home economics in business and in the administration of hospitals, school cafeterias, and public institutions; improvement in living standards of rural homes; and home economics training for social welfare and public health work.

On the scientific side, the delegates to the Pittsburgh meeting will consider ways in which recent research in housing, household equipment, foods, and clothing should be interpreted and adapted for the average consumer. Experts from government bureaus, state experiment stations, and state universities will report on recent research projects of interest to homemakers.

Equipment Standardization Commission Starts Organization in Argentina

The first meeting of the National Standardization of Equipment Commission of Argentina was held recently in Buenos Aires, according to a report to the U. S. Department of Commerce from the American Commercial Attache at Buenos Aires.

The objectives of the Commission were reported to be the study of equipment and the fixing of uniform norms upon which to base the efficiency and quality of equipment, in the same way in which similiar organizations in other countries are functioning.

No definite plans were formulated at the first meeting. It was announced, however, that a secretary of the Commission, as well as subcommittee members, would be chosen at the next meeting. The president of the Commission has not yet been appointed, according to the report.

Thompson Represents A.S.T.M. On ASA Board of Directors

GUSTAVE W. THOMPSON, member of the Board, National Lead Company, Brooklyn, N. Y., has just been elected to membership on the Board of Directors of the American Standards Association, representing the American Society for Testing Materials.

Mr. Thompson was chief chemist of the National Lead Company from 1892 until his retirement this year. In 1916 he became a director of the Company. He is also a director of the Titanium Pigment Company, subsidiary of the National Lead Company.

As a member of the American Society for Testing Materials since 1903, his chief activity has been in Committee E, now known as Committee D-1 on Protective Coatings for Structural Materials, of which he was secretary for a number of years. He was elected vice-president of the Society in 1926, and president in 1928.

He is also a member of the American Association for the Advancement of Science, the American Chemical Society, the Society of the Chemical Industry, the American Institute of Chemical Engineers, of which he was president in 1918, and the Chemists' Club of New York.

Three other members of the Board of Directors of the American Standards Association have been re-elected: Wallace Falvey, vice-president, Massachusetts Bonding and Insurance Company, New York, representing the National Conservation Bureau; John C. Parker, vice-president, Consolidated Edison Company of New York, representing the Electric Light and Power Group; and A. R. Small, president, Underwriters' Laboratories, Chicago, representing the ASA Fire Protection Group.

Blank & Stoller

Gustave W. Thompson

Monthly Index to Technical Magazines

The contents of English language periodicals in the fields of engineering, chemistry, physics, geology, and technology published throughout the world are now collected and published each month in a new magazine called *Current Titles*. The contents are indexed both by subject and by the name of the periodicals included. INDUSTRIAL STANDARDIZATION is one of the 200-odd periodicals included in the monthly listing.

The subscription price for *Current Titles*, 928 Broadway, New York, is $3.00 per year.

Addendum to Standard Changes 150 Lb Pipe Fittings to 175 Lb

An Addendum to the American Standard on Cast-Iron Long Turn Sprinkler Fittings (Screwed and Flanged) (B16g-1929) has just been published and is available from the American Standards Association without charge. The Addendum explains that the 150 lb fittings have been found heavy enough for a service pressure of 175 lb, and all references to 150 lb fittings in the American Standards should, therefore, be changed to 175 lb.

"In order to deplete present stocks," the Addendum says, "fittings marked '150' and bearing a 'year' marking previous to 1938 will be acceptable for 175 lb pressure service."

Australia Starts Work On Lighting Standards

Work on standards for lighting factories, libraries, schools, and commercial buildings has been started by a committee of the Standards Association of Australia.

Safety Pays!

In 1937, accidents took 106,000 lives, cost more than 3 billion dollars

To Prevent Accidents — regulatory authorities, insurance and industrial safety engineers, and highway traffic experts use AMERICAN STANDARD SAFETY CODES as best practice

Safety Codes are available for:—

Abrasive wheels, B7-1935, 10¢
Air-conditioning systems, Z33.2-1938
Blower and exhaust systems, Z33.1-1938
} 15¢
Building exits code, A9-1937, 75¢
Coal-mine transportation, M15-1931, 20¢
Coal mines
- explosives, M14-1930, 25¢
- electrical equipment, M2-1926, 5¢
- rock dusting, M13-1925, 25¢

Compiling statistics
- injury causes, Z16.2 (draft), 50¢
- rates, Z16.1-1937, 20¢

Construction, A10-1934, $2.00
Drinking fountains, Z4.2-1935, 10¢
Dust explosions, prevention
- coal pneumatic cleaning plants, Z12f-1930
- flour and feed mills, Z12.3-1935
- pulverized fuel systems, Z12.1-1935
- pulverizing systems for sugar and cocoa, Z12b-1931
- spice grinding, Z12h-1931
- starch factories, Z12.2-1935
- terminal grain elevators, Z12.4-1935
- use of inert gas, Z12i-1931
- wood-flour manufacturing, Z12g-1931
- wood-working plants, Z12.5-1935

(These are all published together, price 25¢)

Electrical code, National, C1-1937, 5¢
Electrical safety code, National, C2-1927
Part 1, 10¢; Part 3, 15¢; Part 5, 10¢; Handbook 16—Wood Poles, 10¢
Elevators, A17.1-1937, $1.00
Elevator inspectors' handbook, A17.2-1937, 75¢
Exhaust systems, design and operation, Z9, 40¢
Fire tests for building and construction materials, A2-1934, 25¢
Floor and wall openings, A12-1932, 20¢
Forging and hot metal stamping, B24-1927, 15¢
Foundries, protection of workers, B8-1932, 20¢
Gas mask canisters, identification, K13-1930, 5¢
Gas safety code, K2-1927, 20¢
Grade crossing protection, D8-1937, 10¢
Hand and foot presses, B11-1937, 50¢
Ladders, A14-1935, 25¢
Ladders and stairs for mines, M12-1928, 25¢
Laundry machinery and operations, Z8-1924, 5¢
Lighting
- factories, mills, A11-1930, 20¢
- schools, A23-1938, 25¢

Lightning, protection for
- buildings, C5.2-1933
- persons, C5.1-1937
- structures containing inflammable liquids and gases, C5.3-1937

(These are published in one pamphlet, price 15¢)
Logging and sawmill safety code, B13-1924, 60¢
Metal mines, fire-fighting equipment, M17-1930, no charge
Paper and pulp mills, P1-1936, 25¢
Piping systems, identification, A13-1928, 50¢
Power presses, B11-1937, 50¢
Power transmission, mechanical, B15-1927, 35¢
Railings and toe boards, A12-1932, 20¢
Refrigeration, mechanical, B9-1933, 30¢
Rubber mills and calenders, B28a-1927, 5¢
Safety glass for motor vehicles, Z26.1-1938, 20¢
Sanitation, industrial, Z4.1-1935, 20¢; Z4.3-1935, 10¢
Textile safety code, L1-1929, 5¢
Traffic
- control devices, D6-1935, 50¢
- colors for signals, D3-1927, 25¢

Window cleaning, A39-1933, 20¢
Woodworking plants, O1-1930, 10¢

Order Your Copy from

AMERICAN STANDARDS ASSOCIATION

29 West 39th Street **New York**